JUNE
1953

DIGEST

SAN FRANCISCO – A new $2-million trade center will soon make it easier to do business in the U. S p13

MEXICO'S PRESIDENT Adolfo Ruiz Cortines: "I will stop this dishonesty!" The skeptics were surprised to find he meant it p15

NEW WELDING METHOD developed by Consolidated Western Steel Corp. makes freight-car underframes with ease . p25

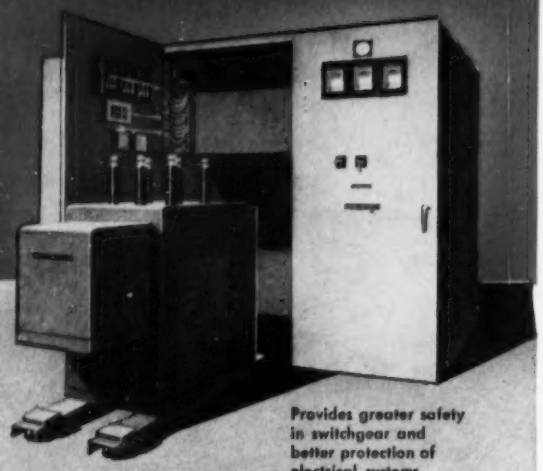
WOMEN in business are not hard to handle. Remember – married women, old maids or career girls – they are still the "opposite sex" p28

FOOD PACKAGING is getting faster and more efficient. Special safety devices, better design and new metals are behind a trend p41

SONICS – This strange tool takes the same kind of energy you talk with and cuts holes in tungsten carbide p53

75 Years OF ELECTRICAL PROGRESS

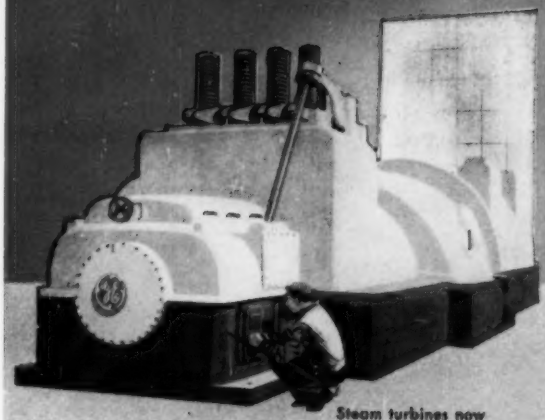
Developed Metal-Clad Switchgear with Flame-Retardant Insulation



Provides greater safety in switchgear and better protection of electrical systems.

GENERAL ELECTRIC
—U. S. A.—

Developed Large Steam Turbine For Power Generation



Steam turbines now generate over 70% of the electric power in the United States.

GENERAL ELECTRIC
—U. S. A.—

Developed Successful Diesel-Electric Locomotive

Nearly 20,000 diesel-electrics now operating on North America's railroads stem from the pioneer locomotive built by General Electric, American Locomotive and Ingersoll-Rand

GENERAL ELECTRIC
—U. S. A.—

1878 **75** 1953
YEARS OF ELECTRICAL PROGRESS

On October 15, 1878, Thomas A. Edison organized the first of the companies which became the General Electric Company. Making contributions such as those shown here, the men and women of General Electric have enabled the company to become a leader in business and industry.

G-E advances come from many sources. Some grow from the combined research of G-E laboratories. Some are engineering triumphs. Some are credited to progressive manufacturing and marketing techniques. Many are performed in cooperation with our customers. All have this in common: they help improve products and productivity which in turn promote better living everywhere.

As part of our 75th anniversary celebration, all the people of General Electric resolve to provide you—our valued customer—with even better service. We hope you will challenge us as to ways we can better serve your business. 1A-53-52E

You Can Put Your Confidence In—

GENERAL ELECTRIC
—U. S. A.—

Here is an example of the rugged work the HD-20 is capable of doing. This Allis-Chalmers tractor-bulldozer is working on a super highway under construction in Mexico.

POWER for construction...

HD-5
40 drawbar hp.
5,100 kg. (11,250 lb.)

HD-9
72 drawbar hp.
8,528 kg. (18,800 lb.)

HD-15
109 drawbar hp.
12,630 kg. (27,850 lb.)

HD-20
Hydraulic Torque Converter Drive
175 net engine hp.
18,595 kg. (41,000 lb.)

One of the most useful and indispensable of all machines is the modern track-type tractor. It contributes immeasurably to the prosperity of nations through its ability to perform the most arduous construction tasks in less time and at lower cost.

Allis-Chalmers builds four heavy-duty diesel tractors of this type. From the smallest to the largest, and with the equipment available for them, they are universally used for all kinds of construction work, such as excavating, land clearing, and road construction . . . also for mining, logging, agriculture, the laying of pipe lines, and many other operations requiring great power, mobility and stamina.

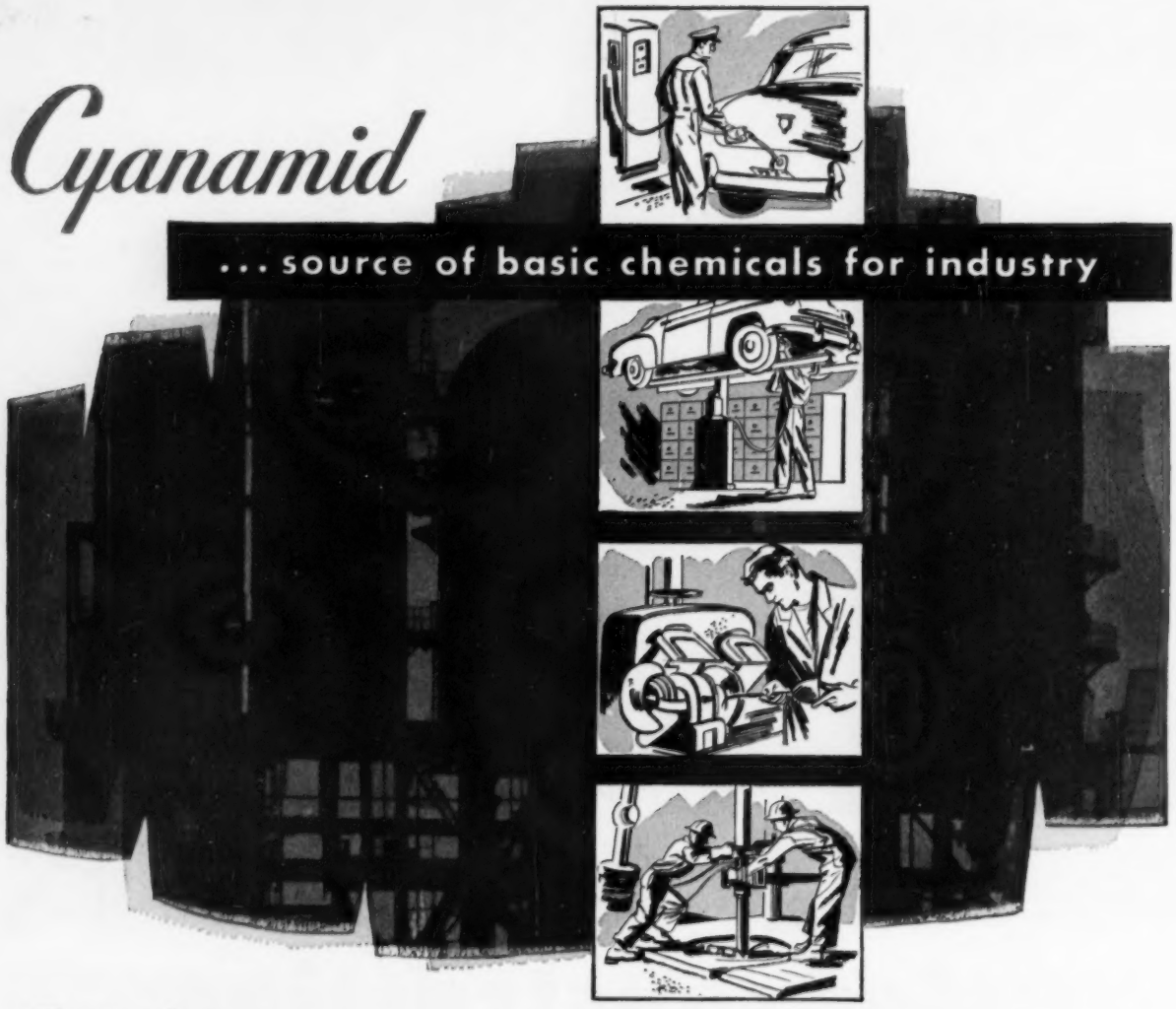
For full information regarding these modern tractors, consult the Allis-Chalmers distributor in your area.

ALLIS-CHALMERS
DEPT. MH653 • TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

BUILDERS OF MACHINERY SINCE 1847

Cyanamid

... source of basic chemicals for industry



Petroleum ... Cyanamid Specialties for the Petroleum Industry

Help Producers and Refiners Make Better Fuels, More Useful Lubricants

Cyanamid chemicals serve in many branches of the petroleum industry. These chemicals include additives for lubricating oil and grease formulations, drilling mud conditioning compounds, and catalysts for refining. Through research and technical service, Cyanamid works continuously with the petroleum industry to produce better products.

For Drilling Mud Treatment

AEROPAN® Drilling Mud Conditioner, a high molecular weight, water-soluble polymer based on acrylonitrile, a water loss control reagent and mud stabilizer.

AEROFLO® 40, for supplementary treatment of phosphate treated muds.

For Petroleum Refining

AEROCAT® Microspheroidal Synthetic Fluid Cracking Catalysts, the widest range of grades available, with high chemical purity, high surface area, high catalytic efficiency.

AERO*Specialty Catalysts, for gas reforming, carbon monoxide oxidation, ammonia synthesis, and other special processes.

For Coloring Gasoline

CALCO® Oil Soluble Dyes.

For Lubricating Oils

ACCOLUBE® Additives and AEROLUBE® MB Inhibitor, to improve oxidation stability, retard bearing corrosion, impart detergent qualities.

For Lubricating Greases

CYANAMID Gelling Agents, special grades for formulating aluminum type greases of lower cost, superior stability and performance.

*Trade-mark

AMERICAN Cyanamid COMPANY

30 Rockefeller Plaza, New York 20, N. Y.

Representatives Throughout the World

Products are not offered in countries where adversely-controlled patent rights exist.

A Digest Service

Dear Reader:

Today the postman brought me a letter from a reader in Melbourne, Australia. He surprised me by asking how he could get a copy of a particular original article from which a digest had been made. His letter made me wonder how many subscribers realize that they can get free copies of original articles by simply writing to us and asking for articles they want.

When you became a subscriber to the McGraw-Hill Digest, I wrote you a letter to welcome you as a reader, to tell you something of the Digest, and to tell you how we thought you could use the Digest to get the most value out of the reading time you put into it. Let me now re-emphasize that you are invited to request the original articles whenever the condensed items in the Digest are of particular interest to you.

They will be sent to you at no extra cost as long as they are available. It's a good idea to write us as soon as possible after getting your copy of the Digest to make sure that you get the articles you want before the supply is exhausted. Many subscribers ask for as many as ten original articles each month.

You can help us fill your request and serve you faster by including in your letter complete information on the article you want—the month and page of the Digest issue as well as the source information at the end of the Digest article. For example: Pure-Iron Process, June Digest, page 39—Chem Eng, Apr, p189.

When you ask for original articles from McGraw-Hill magazines, we send them directly to you. But when you want an article from a magazine not published by McGraw-Hill (see page 60), please expect a somewhat greater delay as we have to ask that editor to send it to you.

Sincerely yours,

Harry S. Wharen

EDITOR

McGRAW-HILL DIGEST

. . . the best from 48 business magazines—see p60

Volume 8 | June 1953 | Number 6

FEATURES

Courting World Trade 13
Mexico — A Country in a Hurry 15
Frame Welding 25
When You Handle Women 28
Cut Yarn-Waste Costs 34
Pure-Iron Process 39
Keeping Up With the Times 41
Sonic Energy — A New Tool 53

AVIATION, TRANSPORTATION
It Costs Big Money 19
Light Support Plane for Japan 33
Driver Cooperation Cuts Costs 39

CHEMISTRY, METALLURGY
All-Jute Boxboard 19
New Silicone Coatings 22
Chemical Notes Abroad 26

CONSTRUCTION
Power and Fresh Water from Sea 22
Breaks Concrete Fast 23
Stabilizes Wet Ground 31

ELECTRICITY, POWER
Turbine Burns Peat 22
Atoms for Power 37
Recovers Heat From Exhaust 38

ELECTRONICS
Radio Controlled Street Lights 23
Cuts Germanium Costs 31
Device Shrinks Time 50% 34

FOOD PROCESSING
Better Fish Freezing 22
Atomic Sterilization 33
Chlorine Improves Poultry 39

METALWORKING
High-Speed Superfinish 19
Previews Machines of Tomorrow 22
Tests Steel Drawability 38

MINING, PETROLEUM
Cuts Costs in Mining Low-Grade Ore . . 26
Better Than Words 33
New Exploration Tool 50

PLANT MANAGEMENT
Educators Go to Work 19
How To Train New Supervisors 21
More From Labor-Turnover Reports . . . 30

TEXTILES
New Tricot Dyeing Method 19
Stripping New Fibers 33
New High Speed Garnet 47

DEPARTMENTS

Business Trends 7
Washington Report 11
This Month's How To 21
Technical Shorts 33
New Products 44
Management Report 57
Production Ideas 58

Harry S. Wharen *Editor* | **Joseph A. Cohn** *Assistant Editor* | **Arthur R. Poutray** *Assistant Editor* | **W. Howe Sadler** *Publications Manager*

Walter H. Diamond *Trends' Editor* | **J. K. Van Denburg, Jr.** *Editor, World News* | **George B. Bryant, Jr.** *Washington Bureau* | **Boyd France** *Washington Bureau*

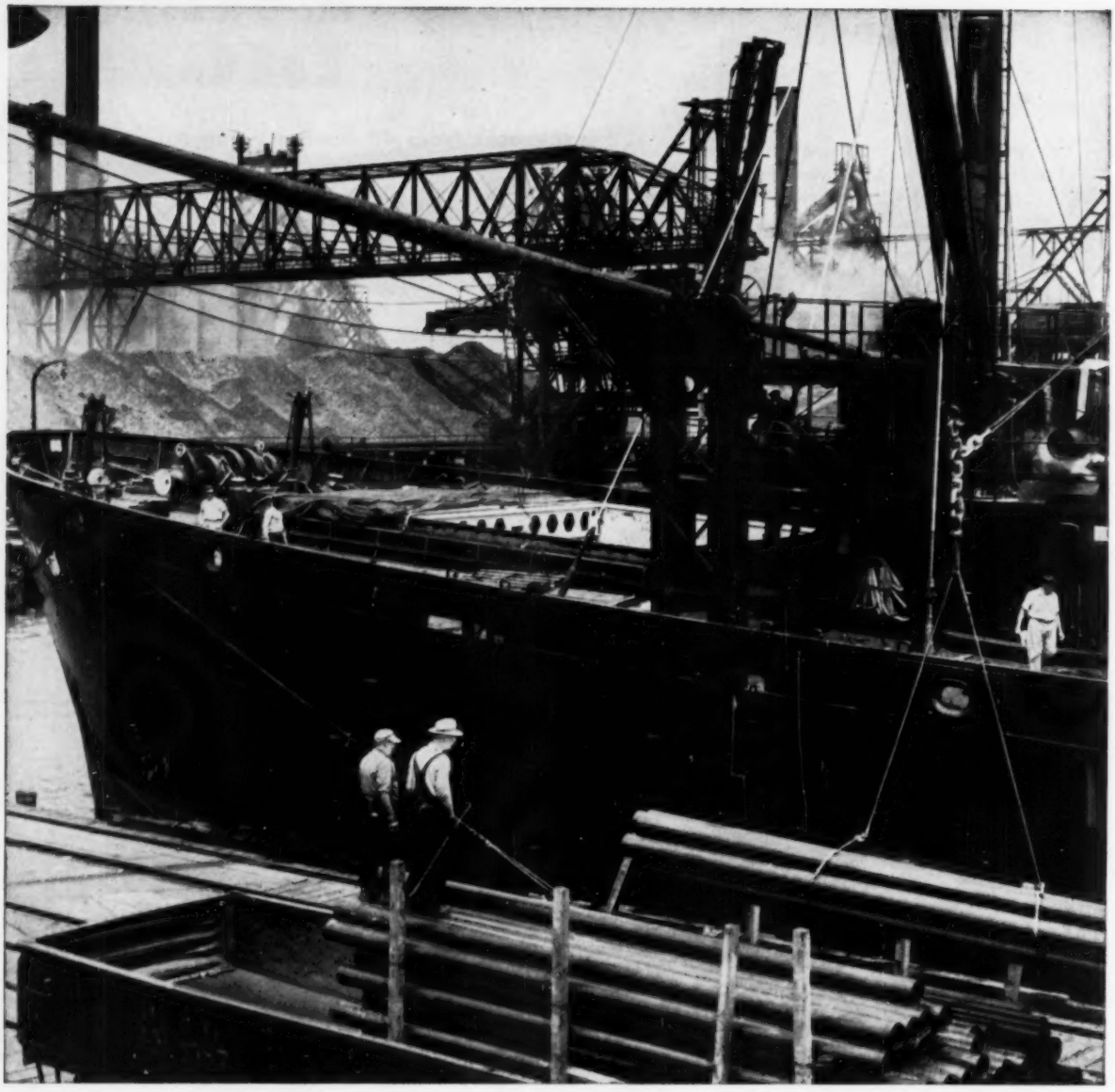
June 1953 McGRAW-HILL DIGEST Vol. 8—No. 6

Member — Audit Bureau of Circulations

Published monthly by McGraw-Hill International Corporation for circulation in all countries of the world except the United States and Canada. *Publication office:* 99-129 North Broadway, Albany 1, N. Y., U. S. A. *Executive and editorial offices:* 330 West 42nd St., New York 36, N. Y., U. S. A. Curtis W. McGraw, Chairman of the Board; Willard T. Chevalier, President; Eugene P. Warner, Senior Vice-President; Joseph A. Gerardi, Treasurer; John C. Cooke, Secretary; J. C. Stark, Vice-President Publications Division; K. Presbrey Bliss, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Director of Circulation.

Subscriptions may be ordered through Director of Circulation, through local book dealer, or McGraw-Hill Publishing Co. Ltd., McGraw-Hill House, 95 Farringdon St., London, E. C. 4 (British only). Subscription rates: $5 for 1 year, $8 for 2 years, or $10 for 3 years; single copy 50¢ (U. S. currency). Entered as second-class matter January 1, 1953, at the post office at Albany, N. Y., under the Act of March 3, 1879.

Copyright, 1953 by McGraw-Hill International Corporation, 330 West 42nd Street, New York 36, New York. Reproduction of items in full or part without written permission prohibited in all parts of the world.



From the Steel Mill right into the Ship

Bethlehem's great Sparrows Point plant in the Port of Baltimore, U.S.A., is the world's largest steel mill located on tidewater. Products for export can be loaded at this plant directly aboard ship—an arrangement with twin benefits to the purchaser.

First, it eliminates the delays caused by long overland freight hauls.

Second, it minimizes the possibility of damage by greatly reducing the handling required.

Our Sparrows Point plant has served the export market for years. With its tidewater location, it can quickly have your order on the way—thereby saving days or even weeks. Bethlehem Steel Export Corporation, 25 Broadway, New York 4, U.S.A. Cables: "BETHLEHEM, NEWYORK."

Bethlehem supplies steel to world markets in all forms, including

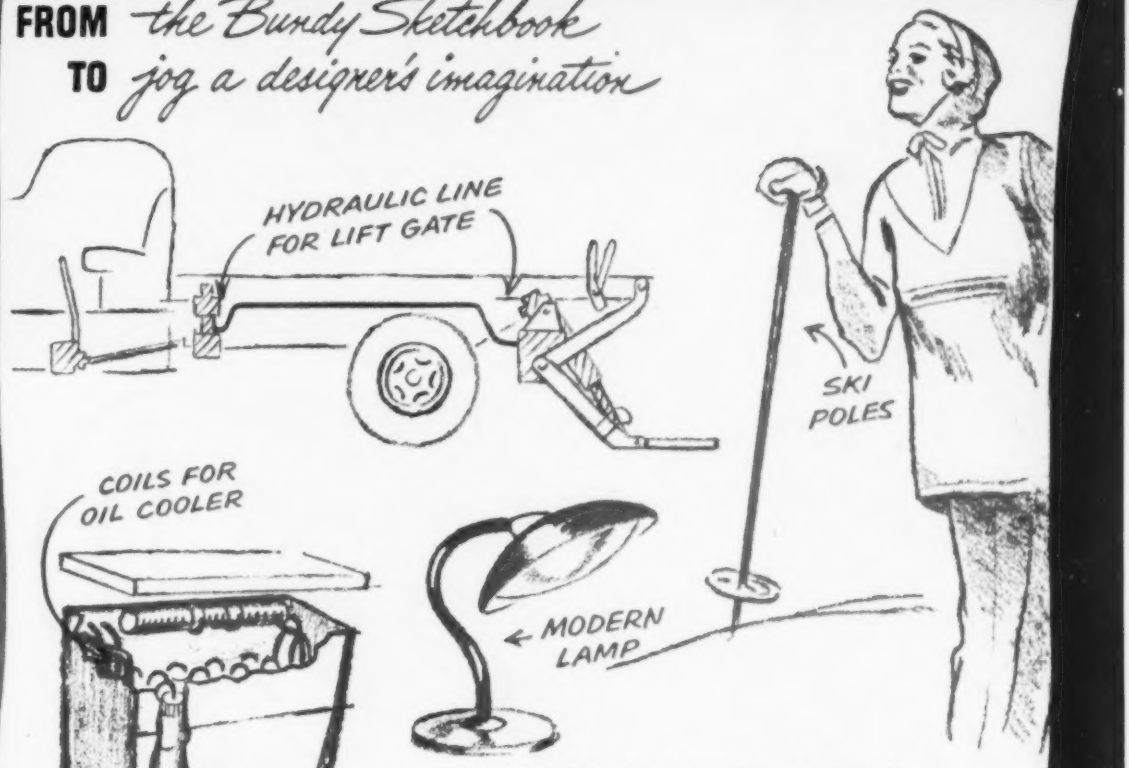
BARS ★ ALLOY STEELS ★ TOOL STEELS
PLATES ★ STRUCTURAL SHAPES
SHEETS ★ STRIP ★ TIN PLATE ★ PIPE
WIRE PRODUCTS ★ RODS ★ RAILS

★ BETHLEHEM STEEL ★

Offices and representatives in all principal cities of the world

702E

FROM *the Bundy Sketchbook*
TO *jog a designer's imagination*



REMARKS Need tubing that will do a better job for you? Look into Bundyweld. Need fabricated tubing parts? Let us tell you about Bundy's unmatched facilities. Need engineering help? Let us show you what we can do.

WRITE → today for catalog or for help in developing your idea for a tubing application.

BUNDY TUBING CO., DETROIT 14, MICH.

Bundyweld Tubing

® DOUBLE-WALLED FROM A SINGLE STRIP

Leakproof
High thermal conductivity
High bursting point
High endurance limit
Extra-strong
Shock-resistant
Ductile

Lightweight
Machines easily
Takes plastic coating
Scale-free
Bright and clean
No inside bead
Uniform I.D., O.D.

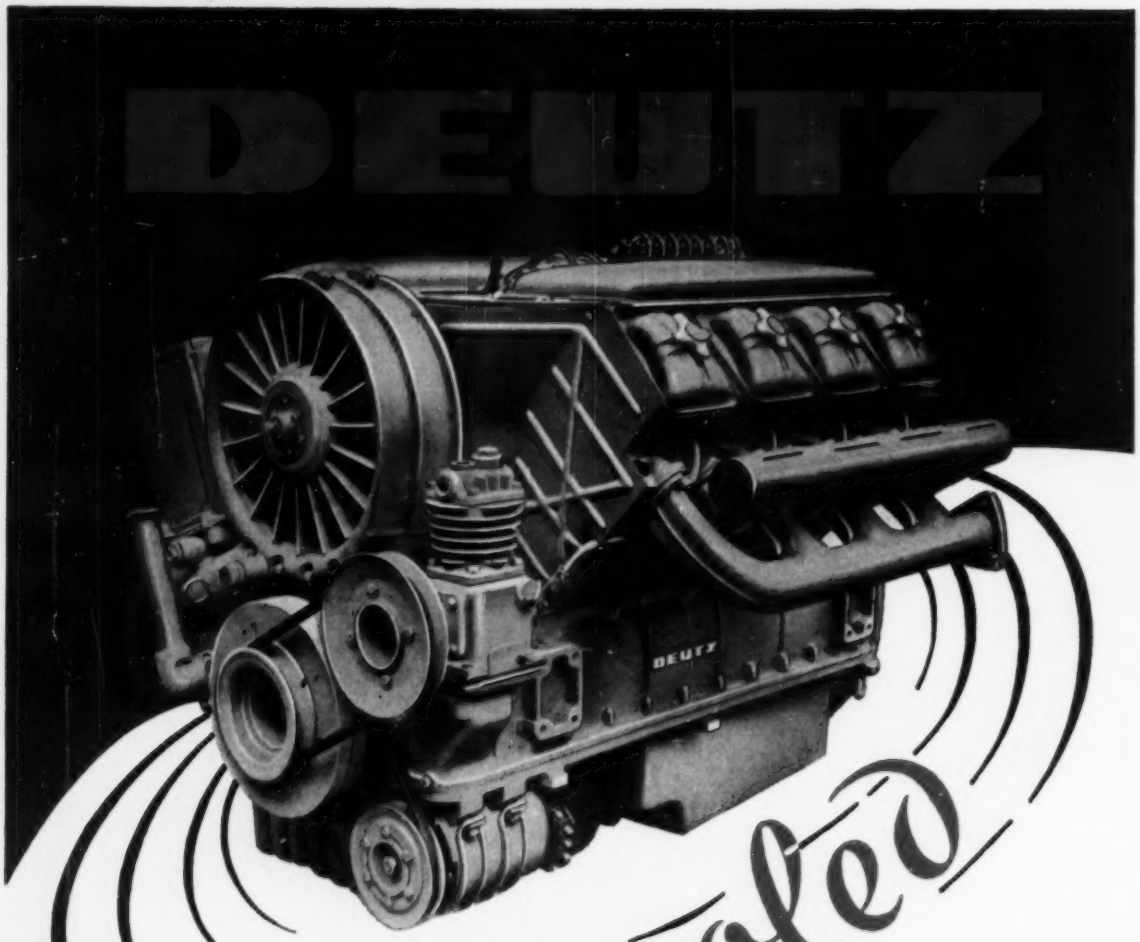
WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . . . continuously rolled twice around laterally into a tube of uniform thickness, and passed through a furnace. Copper coating fuses with steel. Result . . . Bundyweld steel tubing, double-walled, and brazed through 360° of wall contact.

Sizes up to ⅝" O.D.

← NOTE the exclusive patented Bundyweld beveled edges, which afford a smoother joint, absence of bead and less chance for any leakage.

DEUTZ



air-cooled

1–8 cyl.

AIRCOOLED DIESEL ENGINES

THE LATEST ACHIEVEMENT IN MODERN DIESEL ENGINE DESIGN

NO COOLING WATER TROUBLES

FROM ALASKA (–40° F) TO THE TROPICS (+140° F)

12–175 HP FOR EVERY TYPE OF SERVICE
FOR TRACTORS, TRUCKS, COMPRESSOR- GENERATING- AND PUMPING-SETS
BUILDING MACHINERY, EXCAVATORS, MARINE-ENGINES etc.

ASK FOR FULL INFORMATION

KLÖCKNER-HUMBOLDT-DEUTZ AG · KÖLN

COLOGNE / GERMANY

BUSINESS TRENDS

AMERICAN BUSINESSMEN intend to increase their manufacturing capacity by 16% in the next 4 years. Sales are expected to rise 19% in the same period. These are the highlights of McGraw-Hill's sixth annual survey of large U. S. firms. Here are other significant facts:

An average of $20-billion annually will be spent for new plant and equipment. This is $4-billion more than the capital outlay made in each of the peacetime years from 1947 to 1950. Chemical, electrical-machinery and transportation-equipment companies will benefit to the greatest extent between now and 1956. They are the fastest growing industries.

Automobile and machinery expansion also will be above average. On the other hand, expenditures for increased steel capacity are destined to shrink over the next 4 years. Manufacturers of durable consumer goods contemplate spending more in the years ahead.

Modernization, not actual expansion, will absorb most of the spending. By 1956, it is expected that 62% of capital expenditures will go into modernization and replacement. This compares with 51% in 1952. Transportation equipment will make the fastest change-over, with 83% going toward modernization from 1954-56.

Capital spending is most urgent for those industries on the verge of new products or new processes. Gas turbines for cars and trucks will need new plants and tooling. Jet airliner production will come of age. Hydrogenation of coal to extract chemicals may reach an advanced stage. Other investment needs: catalytic reforming by oil refiners, high-temperature food canning methods, large forging presses.

WORLD CURRENCY ADJUSTMENTS can be expected as a result of weakening resistance to devaluation. Several nations are planning to change the value of their currency. Both official and free rates will be affected.

U. S. Export-Import Bank and the International Monetary Fund are resorting to pressure. They will base more and more loans on the willingness of applicants to realign their exchange to the dollar. All recent U. S. administration talks with foreign missions have emphasized importance of currency devaluation.

France will be forced to cut the value of the franc before long. She promised this action in return for U. S. concessions granted to the French ministers on their visit here. French exports no longer sell themselves in the U. S. as they are way overpriced.

Germany has one of Europe's strongest currencies and will not tinker with the Deutschemark. She has built up huge credit balances at the European Payments Union (EPU).

Freeing of large blocked balances in the West could weaken the Deutschemark. This is unlikely until Allied occupation ends and full sovereignty is restored to Germany. But you can expect full transferability of German currency within a year. Even now, French and Belgian francs can be traded freely on the West German exchange market.

Devaluation of the Turkish pound appears sure. Value prevailing in Istanbul's flourishing black market has fallen 75% below the official rate. Turkey is the third largest EPU debtor.

Unsold wheat surpluses are the main trouble. The country is selling wheat 20% below the price paid to Turkish peasants. Depreciation of the Greek drachma also imperils the Turkish pound because of cheaper Greek tobacco.

An adjustment in the Norwegian krone is also a possibility. Changes in value of the Yugoslav dinar and the Finnish mark are under consideration, but are not likely to be made. Finland has been making a noticeable comeback in her foreign trade since the heavy reparations burden to Russia has been ended.

Brazil will have to fix an official parity for the cruzeiro. The free-market rate adopted in February is not working. Both U. S. and British businessmen are disappointed. London wants Brazil's new law to be revoked at once. Tip-off will come when Brazil adds coffee exports to the free-exchange product list.

Both political and economic trouble in Pakistan means the rupee may yet be depreciated. Gold and sterling reserves dropped $263.2-million in the last year. Cotton and jute export prices must be reduced. Pakistan still feels the disadvantage resulting from disparity of currency value with India's currency.

Governor Miguel Cuaderno of the Central Bank of Philippines told us that the Philippines will not devalue. He says that keeping the peso steady prevents further inflation. However, if world commodity prices dive, nothing can save the peso from devaluation.

Make customers choose your product
—pack it in **REYNOLDS ALUMINUM FOIL**

When two products are identical in quality and price, your customer will choose the one packaged for freshness in gleaming, colorful Reynolds Aluminum Foil, plain or printed.

Consumers the world over are fast learning that Reynolds Aluminum Foil preserves the freshness and aroma of packaged foods... keeps them free from moisture and contaminating odors. And—Reynolds Aluminum Foil greatly improves the quality appearance and attention value of a product ... for it can be printed in any color or design to bright, brilliant perfection.

Profit from the experience of other manufacturers—package *your* product in Reynolds Aluminum Foil and increase *your* sales. Our experts will gladly tell you how . . . without obligation. Write to:

REYNOLDS METALS COMPANY

LARGEST U. S. ALUMINUM EXPORTERS

Agents throughout the world

INTERNATIONAL DIVISION, 19 EAST 47th STREET, NEW YORK 17, N. Y. · CABLE: FOILWAX, NEW YORK

ENJOY CLEAN COOL AIR... CONVENIENT COOL REFRESHMENT

With These Advanced New Appliances for Home or Office by Servel

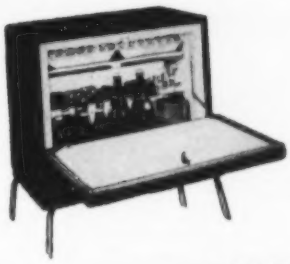
NEW DELUXE SERVEL ELECTRIC ROOM AIR CONDITIONER

This quiet, efficient unit gives you the advantage of full ¾ or 1 horsepower cooling which will keep your room in home or office cool as a mountain top on hottest, most humid days. Enjoy Servel made-to-order weather, luxury and comfort.

The Servel SUPER QUIET room conditioner filters out dust, soot and pollen, keeps walls and furnishings cleaner longer . . . reduces humidity. You breathe clear, drier air — feel better, stay fresh and alert.

NOTE THESE EXCEPTIONAL FEATURES:

- Choice of ¾ or 1 H.P., 60 cycle or 50 cycle, 115, 208, or 230 volt operation. 50 cycle models produce same full rated capacity as 60 cycle. (State cycle and voltage required.)
- New single dial control — simple setting.
- Setting for reduced power gives steady-comfort climate after daytime heat has subsided.
- Super Quiet cooling unit "floats"—reduces hum. Outside noises STAY outside.
- No-draft adjustable grilles.
- Smartly styled; mahogany or blonde finish.



SERVELETTE—THE NEW PORTABLE ELECTRIC REFRIGERATOR

Puts Chilled Refreshments at Your Finger Tips

NOW—a handsome, compact PORTABLE electric refrigerator for office or home. Makes delicious chilled food and beverages quickly available—within easy reach—in any room. Styled as fine furniture, it enhances any decor, is unobtrusive and operates SILENTLY. The SERVELETTE holds a generous supply of snacks, canned and bottled drinks—with room for *tall* bottles. AC or DC models, 32 to 230 volt operation, choice of mahogany, blonde or white finish; makes 28 large ice cubes. Easy to clean. Open door makes handy tray. A new aid to quick refreshment—gracious hospitality. Ideal also for doctor's office for keeping vaccines, serums, perishable drugs.

Servel

For complete details on the Servelette and Servel Room Air Conditioner, write:

SERVEL, INC., INTERNATIONAL DIVISION

Dept. MD-6 • 20 Pine Street, New York 5, N. Y., U.S.A.

Or see your nearest dealer

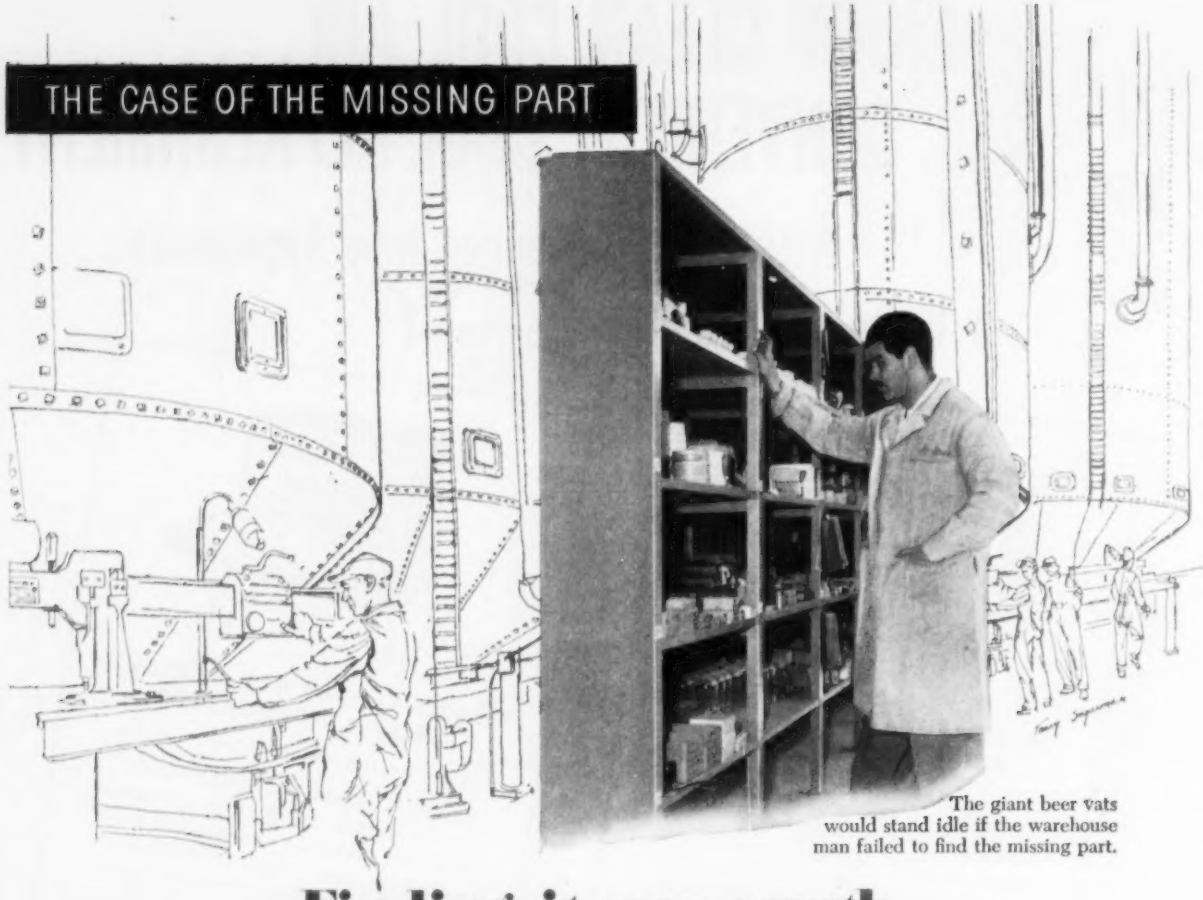
Servel gas, kerosene, electric refrigerators & freezers

Florence gas, kerosene, electric ranges

Servel room air conditioners

Servel industrial air conditioning.

THE CASE OF THE MISSING PART



The giant beer vats would stand idle if the warehouse man failed to find the missing part.

Finding it was worth half a million bottles of beer!

Cervecería Central in Mexico City was putting up 500,000 bottles of their popular Don Quijote beer daily . . . a 300% increase in production over eight years ago! But with this success came a serious problem.

Inventory in their warehouse had grown to 4,000 items, ranging from a few gear pins to tons of malt. It seemed almost impossible to keep track of these widely varied, fast moving items. Yet failure to reorder even an insignificant part might mean a sudden shutdown of important machinery—a costly cut in production.

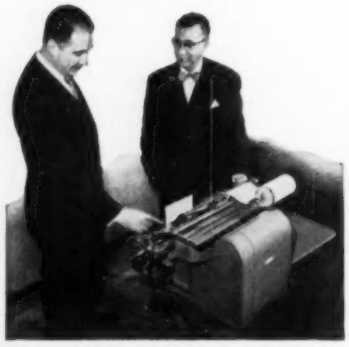
To avoid this dangerous possibility, Director General Enrique Vignau called in the Burroughs man . . . explained the situation.

The Burroughs man, well acquainted with the problems of a rapidly expanding business, outlined a system of warehouse cards which showed at a glance items on hand, when they were used and noted that reorders were placed and automatically restocked. For greatest speed and simplicity, he suggested a Burroughs Typewriter Computing Machine.

Result? With the new system and machine installed, production at Cervecería Central is never in danger of being shut down through some minor error in warehousing.

What about you? Has rapid progress swamped some part of your business with paperwork? Call the Burroughs man. He represents the world's broadest line of modern business machines: Adding, Calculating, Accounting, Billing and Statistical, Cash Registers.

To better *your* business, call the Burroughs man—today! Sales and Service Offices in major cities around the world. The Burroughs Adding Machine Company, Detroit 32, Michigan, U.S.A.



Director General Enrique Vignau of Cervecería Central S.A., Mexico City, examines his new Burroughs Typewriter Computing Machine. With him on the left, is Salvador Montes, the Burroughs man who helped solve the Case of the Missing Part.

FOR EXPERT ADVICE IN ANY FIELD OF BUSINESS FIGURES...

CALL THE Burroughs MAN

WASHINGTON REPORT

EISENHOWER'S Latin American policy is beginning to take shape. There will be nothing startlingly new about it. Keynote still will be non-intervention in internal affairs south of the border.

Some business groups are urging the administration to put pressure on Latin American governments to give them a better deal. Labor groups are asking Washington to throw its weight behind free Latin American labor unions. Some congressmen want administration to force good neighbors to get tough with Communism and Peronism.

But State Department will not give in to this pressure. It insists any U. S. attempts at economic, political or military coercion would rally the whole of Latin America against Washington, would push many governments towards the Kremlin or Peron Latin Americans themselves can be counted on in the long run to contain totalitarianism, the State Department thinks.

Loans from the Export-Import Bank, plus technical assistance, will remain the chief tools of economic policy. There will be no grant aid handouts in the Western Hemisphere. The administration figures any grant program would create serious bickering and hard feelings in Latin America unless it were impossibly large.

There may be innovations in U. S. policy though. Some ideas getting serious study are:

- Turning over technical-assistance programs gradually to private foundations—Ford, Rockefeller, etc.
- Training more young Latin Americans in U. S. universities for technical jobs.
- Giving U. S. investors in Latin America additional preferential tax treatment, coupled with demands that good-neighbor governments be more neighborly, especially tax-wise, toward foreign investors.
- Tightening working relationships between the U. S. government and American investors and businessmen in Latin America. The objective: Washington would give closer support to U. S. business interests if the companies concerned kept their policies in line with national policy goals.

One thing is sure. Latin America will get more diplomatic attention than in the past. Ambassadors in Washington will not have to wait so long to see the President or the Secretary of State. U. S. ambassadors and diplomatic personnel will court the goodwill of Latin American governments more assiduously.

All these changes would help check the deterioration in U. S.-Latin American relations. But none of them go to the heart of the problem—trade. Administration planners are convinced that any substantial slackening of U. S. demand for Latin American exports would raise political hob there.

The outlook for trade south of the border has Washington worried. Eisenhower's trade liberalization policy is badly snarled in politics. In Congress, several bills are pending that would hit key Latin American exports to the U. S.

Twenty odd bills would slap quotas on imports of Venezuelan oil. Even the threat of such action probably will kill U. S. oil companies' hopes that Venezuela would permit more exploration for new oil fields. Tapering off of stockpiling and rearmament already is weakening the prices of some of Latin America's nonferrous metals.

Real nightmare of administration Latin American experts is the probability of a shakeout of the U. S. economy sometime within the next 2 years. They guess that even a 3% drop in the U. S. gap could cut imports of raw materials by as much as 50% and torpedo the Latin American economy.

Washington is mulling over emergency measures that might be taken to tide Latin America over any U. S. recession. One idea that is being studied is a price support program for key imports from Latin America. Good-neighbor governments are sure to suggest some such device at the first hint of a drop in U. S. business activity. But odds are Congress would veto that one.

So it looks as though Latin America would have to weather a U. S. recession on its own. Right now, Washington is betting the shakeout, if it comes, will not be long or deep enough to hurt badly.

THE STRETCHOUT in Western European rearmament was inevitable. The peace offensive in Moscow and the economy drive in Washington ruled out a continued big arms buildup. And real defense of the Continent will have to wait until West Germans start mobilizing anyway.

The big question now is whether even the reduced defense targets set at Paris can be met. They probably can if Congress votes the economic aid and offshore procurement funds the administration wants. But a big additional cut in economic aid would turn the stretchout into a foldup. Every dollar chopped off economic aid will reduce European defense spending by at least $3 because only aid dollars can buy key bottleneck raw materials for European rearmament.

FLEXIBLE POWER *for faster production*

Wherever you need power, you need Westinghouse Bus Duct to bring it to your motors, lighting system and other electrical equipment. Made of copper bars (replacing cable and conduit) suspended by insulators in steel housings, Westinghouse Bus Duct carries up to 600 volts from transformer to switch-gear, then to operating equipment.

With Westinghouse Bus Duct in your plant you can make additions or changes in your production lines without expensive power system modifications, or interruption of production schedules. Westinghouse Bus Duct is easily dismantled, rearranged and set up to meet new demands . . . giving you flexible power for faster production.

There's a type of Westinghouse Bus Duct for every power-carrying job . . . Plug-in Duct with outlets every 12 inches for power take-off . . . Feeder Duct for trunk lines . . . Weatherproof Duct for outside use . . . and Low Impedance Duct for long feeder runs. Each is completely prefabricated and ready to install—just bolt the sections together.

For complete information on Westinghouse Bus Duct write today to Lighting Department at address below for your *free* copy of brochure B-4271Z-Int.

YOU CAN BE **SURE** ...IF IT'S

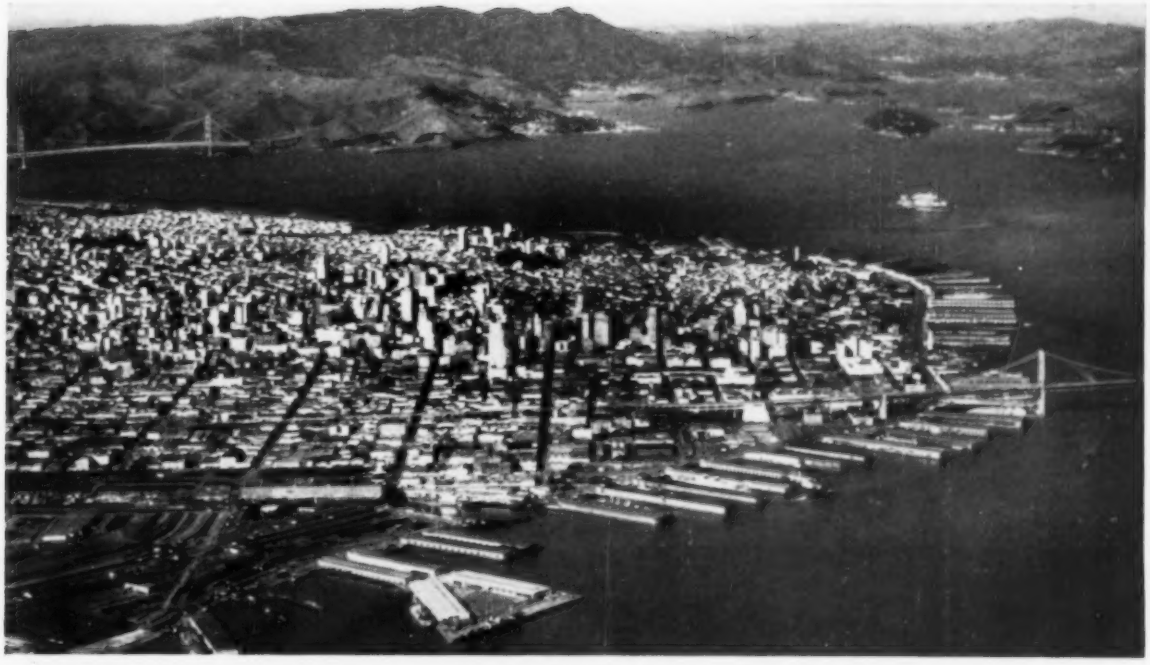
Westinghouse

WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY

40 Wall Street, New York 5, U. S. A.

JUNE 1953
VOLUME 8 • NUMBER 6

Mc GRAW-HILL
DIGEST



PANORAMA of San Francisco shows famous Golden Gate, upper left, and San Francisco-Oakland Bay Bridge, lower right. After being burned out seven times, including the great fire of 1906, the city shows no scars.

Port of San Francisco

It Is Courting World Trade

A good harbor aids port growth, but it will not raise shipping by itself. "You have to work for it," says San Francisco.—An original Digest article

ARCHITECTS for the Port of San Francisco this month are finishing plans for an ultra-modern World Trade Center to be built inside the walls of the old Ferry Building, at the foot of Market Street.

The Board of State Harbor Commissioners, administrators for the State-owned port, has set aside $2-million for the center with actual construction scheduled to begin around October 1 of this year. Alteration of the Ferry Building to attract world trade is one of the highlights in the Port's concerted drive for more foreign cargo.

Like other U. S. ports, San Francisco has been hit hard over the last 20 years by the steady decline of intercoastal and coastwise shipping, which was once the backbone of port business. High-speed land transportation, high costs, and unfavorable rates have forced tonnage down. To compensate for this, San Francisco has been courting more foreign trade.

Foreign Trade—Dollar value of foreign goods brought through the Golden Gate last year hit $750-million with import-export tonnage running at least 25% ahead of prewar years—in spite of losing China as a major trading partner.

"The best way we can get more foreign trade is to promote it and compete for it with better services and facilities," vigorous, 54-year old Port Director Robert H. Wylie said recently. "Port competition today is such that you won't get business by sitting around waiting for it."

To support this, Wylie pointed to the Port's $20-million improvement program that got underway shortly after he came to the Harbor Board in 1947. A retired brigadier general, Wylie was Assistant Chief of Army Transportation and had charge of all military traffic, rail, highway and land transport during World War II.

Ten million dollars already has

been spent building and modernizing San Francisco's piers and terminals and another $10-million will be ready shortly.

Coupled with this physical growth is an aggressive port promotion program that has played a big part in San Francisco's growth. Since 1948, the harbor board has increased its annual promotion and advertising budget from $20,000 to $100,000. This five fold increase is perhaps the best proof of the seriousness of the ports drive for new business.

Trade Center—To house the new World Trade Center, the northern half of the historic Ferry Building will be completely gutted inside. Within the shell of the structure, the Port will build a modern three-story, air-conditioned building with new offices, display areas, two restaurants, an international reference library, shopping center, and other services. Manned by a multi-lingual staff, the center will have room for trade displays and adequate business services. The center is scheduled to be in operation by early 1955.

Port management working through the center will aim not only at stimulating trade with the Pacific nations, but will also try hard to build more solid business with Latin America and Europe. If the center succeeds, as Wylie and the Harbor Board are convinced it will, they plan to expand it eventually into a Rockefeller Center-style cluster of buildings overlooking San Francisco Bay.

Complementing the Center is the Port's Foreign Trade Zone No. 3, established in 1948 in half of the big pier 45 terminal adjacent to famed Fisherman's Wharf. Five years of operation have seen the zone double in size and take over the entire 14-acre terminal.

Director Wylie expects that a branch of the trade zone will be set up in the center so traders can display goods duty-free.

Growing Plans—The Port's modernization program has concentrated on both general cargo piers and new terminals for special commodities. Major projects include:

1. Mission Rock Terminal, completed in 1950 at a cost of $6-million. Covering 29 acres and having berthing space for eight ships, Mission Rock has a broad paved area running between its four sheds to accommodate big truck-trailer rigs and speed cargo assembly.

2. Reconstruction of piers 30-32 terminal from two single finger piers into one quay pier, again with a broad central area for truck maneuvering and cargo assembly. This project is the model for future pier modernization.

3. State grain terminal, completed in 1950 to speed exports of California grains, chiefly rice, barley, and wheat. It has proved so successful in 2 years of operation that its 500,000-bushel elevator is now being enlarged to a capacity of 1-million bushels.

4. Construction of the state cotton terminal, the first unit of which will be completed next October. California cotton is the Port's most valuable single export, with nearly 500,000 bales valued at $103-million moving through the Golden Gate in the last cotton-shipping year. The first 5,700-bale unit will be augmented later by three similar ones.

Self-Supporting—Plans for more general cargo terminals along the lines of Mission Rock are on the port architect's drawing boards and will be built as part of the $20-million modernization plan being carried out without costing California taxpayers a cent. The Port of San Francisco has been entirely self-supporting throughout the 90 years of state ownership, financing its operations and improvements from revenues and bond issues.

Summing Up—"San Francisco, with its 42 piers and berthing space for 90 ships, is a natural funnel through which cargoes move by land and water," Wylie declares. "Given good transportation, which we have, and good port facilities, which we are making better, we can get more business. I don't see any reason why we shouldn't be optimistic.

"We have our problems, of course. One of them, for example, is keeping a long-established port like San Francisco up to date when new piers and equipment cost so much.

"Another worry is labor—not so much present labor difficulties as the bad reputation San Francisco has gotten from its past turbulent labor history, but we believe our labor conditions are improving. We have had one major strike in the last 5 years. That's not a bad record for any industry.

"When I say our labor situation is improving, I do not mean to say we shall have no more strikes. No industry can say that. But we can point to a steady improvement in our labor picture over the past several years. And that means better and more reliable service to those using San Francisco and other ports on the Pacific Coast."

SAN FRANCISCO'S famous Ferry Building: On October 1, the whole north half will be torn out, remodeled, and made ready for a new World Trade Center

The industrial revolution in Mexico has added three-fourths to its output since 1939, multiplied exports, given the country 53,000 factories worth $1-billion. It's a country worth watching.—An original Digest article

Mexico—A Country in a Hurry

MEXICO CITY—A Mexico City newspaper recently headlined a story, "Mexico is the most solvent country in the world." This was not exactly the case, but it was a graphic portrayal of the current state of mind of the businessman in Mexico. And it was not far from being literally true as well.

Mexico has been undergoing a genuine industrial revolution. The latest figures indicate the country now has some 53,000 factories worth about $1-billion.

At the same time, Mexico has quietly become a major cotton-growing and exporting country, it has developed a large citrus-fruit and vegetable exporting business. and it now grows as much coffee as Salvador and nearly as much as Colombia And it is still the world's largest silver producer and a ranking producer of lead, zinc, and copper. All these export goods have laid the basis for an exceptionally good economic situation.

Mexico is one of the few countries in the entire world where there is absolutely no exchange control—you can buy or sell dollars as fast as you can count them. And virtually no export or import permits are required.

This absence of exchange and import controls has made Mexico unusually attractive to the foreign investor. Mexico not only welcomes new investments, except in oil and transport, but it also gives tax concessions and helps new industry to find good locations.

The investor in Mexico knows he can sell his plant at any time and move the money back home. Or if he makes a profit, he can transmit it as fast as he wishes. And the Mexican businessman knows he is free to buy any machinery or raw materials he needs from other countries and get them into Mexico as fast as he can arrange transportation. All these factors have helped the boom.

Mexico's foreign-exchange position is good. Last week, the new minister of finance, Antonio Carillo Flores, proudly announced that Mexico now holds $271-million in gold and hard-currency reserves —the most it has had since 1946, except for a minor flurry of refugee capital in 1950.

Despite the fact that Mexico bought $651,714,527 worth of goods last year in the United States (where it does 85% of its buying) and sold only $428,816,-735 worth, it did not have an unfavorable balance of payments.

This difference was made up by invisible exports, such as the 450,-000 tourists who visit Mexico each year and last year left $275-million behind. Mexico also adds to its reserves from its own gold mines.

But the big story of the moment in Mexico is not really economic—it is political.

Mexico held presential elections last July and, as was expected, Adolfo Ruiz Cortines was elected by a five-to-one majority. But what was not expected was the type of president that Ruiz Cortines has turned out to be in his first few months in office.

Mexico has traditionally been plagued by both large and petty graft. There have been charges made in Mexico recently that the previous administration lined its pockets with no less than $500-million to $800-million during its 6 years in office. And this regime, which built scores of new dams and hydroelectric projects, thousands of miles of new highway, 2,500 schools, large housing projects, and refurbished the national railways, was considered better than most. This type of graft had become expected in Mexico.

The public merely tittered when Ruiz Cortines boldly announced in his inauguration address that he was going to end all forms of dishonesty in Mexico. They had heard this before and it meant nothing.

They were more impressed when Ruiz Cortines pushed through the

Mexican Congress a bill requiring all 250,000 federal employes, from cabinet ministers on down and including even the president, to file statements of all their personal wealth. When they leave office, they must file another.

The new anti-corruption law specifies that any enrichment beyond their salaries over their term in office will be accepted as evidence of graft punishable by stiff prison terms. Even wive's and children's holdings must be registered.

Ruiz Cortines himself led off the declaration. It was significant that in over 30 years in public office, while those on all sides of him were getting fabulously wealthy, he had accumulated no more than his modest middle-class home, his inexpensive car, and a bank account that would hardly do justice to any small businessman.

Since then, Mexico has seen half its police fired for taking bribes, scores of federal inspectors ousted, and the law applied to even influential politicians. Today in Mexico absolute law and order is being maintained. People are still cynical about how long it will last, but they are more impressed each day it continues.

At the same time, Ruiz Cortines has been slowly outlining the economic policy of Mexico for the 6 years of his term in office. It runs like this:

• **Oil**—After expropriation of oil properties from foreigners in 1938, the country's petroleum industry hit a disastrous slump. Once the second greatest oil-producing country in the world, Mexico descended to a point where it could not supply its own filling stations in the early 1940's.

Beginning in 1946, a new director of the national petroleum monopoly of Mexico, Antonio J. Bermudez, completely reorganized the industry. Mexico's oil reserve is now up to 2,200-million bbl., and Bermudez plans to spend $125-million on further petroleum refining and producing facilities in the next 6 years.

• **Iron and Steel**—Mexico's two big foundries, Fundidora and Altos Hornos, are expanding their production. Combined, they turn out over 300,000 tons annually of the 600,000 tons of steel Mexico uses. One foundry is currently spending $5-million on expansion, while the other is laying out $6-million for new plant and equipment.

Plans also call for a new steel mill in the Pacific area near Acapulco where a mountain of iron, similar to that in Brazil and Venezuela, has been declared a national reserve. Talks have been carried on in Europe to see if this steel mill could be purchased from Western Germany or France.

• **Transportation** — Some $150-million have been spent on modernizing the Mexican railways over the last 6 years. Much has been achieved, but it is feared the pilfering of funds has been worse here than in most areas. The country bought 140 diesel locomotives, making Mexico the first country in Latin America to be converted to diesel to this extent. Nearly all narrow-gage roads have been changed to standard.

A big problem of any manufacturer coming to Mexico is to assure himself of transportation. The Dole Pineapple Co. was licked when it realized it could not get its perishable product to markets and canneries because of poor transportation facilities and absolute lack of cars. Most companies, such as American Smelting and Mining Co., own their own cars.

The Mexican railways are building new freight yards and new shops, and generally trying to speed things up. Their new freight classification yard, being built north of Mexico City at a cost of $15-million, is said to be the best railroad classification yard in the Western Hemisphere.

• **Construction**—The signs of building construction throughout Mexico and especially in Mexico City leave no doubt that there is a building boom on. Private interests have $30-million worth of construction underway in Mexico City, including a 41-story skyscraper that is the tallest building in Latin America.

The government has built 10,000 miles of highway in the last 5 years, with most of it paved. The Pan-American Highway running like a backbone down the continent is finished from the U. S. border to the Guatemalan border (2,200 miles), while a new trans-isthmian highway under construction will take travelers from the Atlantic (Gulf) to the Pacific coast in 3 hr. by automobile.

The new Mexican Pacific coast highway, running from Mexico City to Guadalajara and thence north along the coast to Nogales, Arizona, is 1,500 miles long and said to be a marvel of highway engineering. Mexico's first toll expressway runs from the capital to Cuernavaca, a nearby resort, and carries up to 5,000 vehicles a day.

Mexico has built a number of

HOW MEXICO'S ECONOMY SHAPES UP

Year	Exports (Millions of Dollars)	Imports (Millions of Dollars)	Mineral Production (1939 = 100)	Industrial Production (1939 = 100)	Agricultural Production (1939 = 100)	Cost of Living (1939 = 100)
1940	85	132	97.4	100	–	100.6
1941	108	199	99.1	104.2	–	104.5
1942	138	172	112.6	110.0	124	121.2
1943	221	212	113.5	115.0	114	158.3
1944	227	311	101.2	117.5	124	198.7
1945	266	372	102.9	125.8	120	213.5
1946	313	600	77.7	129.2	124	266.7
1947	419	719	101.3	135.0	135	300.0
1948	419	597	92.2	135.0	151	318.6
1949	396	520	91.4	145.0	160	335.9
1950	483	597	100.1	160.0	171	355.8
1951	572	889	94.2	171.7	195	400.6
1952	510	796	101.7	–	–	459.0

Over 22,000 Individual Plants are Attracted by ERIEZ Non-Electric Magnetic Separators

If you have a ferrous metal separation problem, you can rely on ERIEZ for:

A. **The most efficient and dependable magnets available.**

B. **The help of engineers best qualified to recommend installations.**

ERIEZ, pioneer developer of permanent magnetic separators, leads the field in both design of equipment and experience in solving magnetic separation problems. By making available highly efficient non-electric magnetic separators that are easily applied to almost any materials-handling system, ERIEZ has been responsible for the rapid acceptance of these devices throughout industry. Properly used, the magnetic strength of an ERIEZ magnet lasts indefinitely . . . it loses less than 1% magnetic strength in a century.

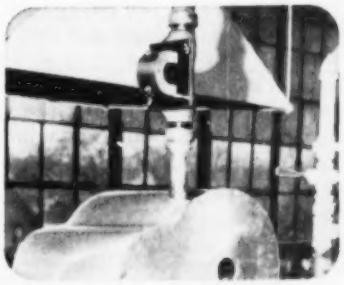
Because ERIEZ permanent magnetic separators have the power to *prevent machinery damage, prevent fires and explosions and eliminate ferrous contamination of products,* they are important to thousands of users. Following are some typical applications:

CHEMICAL—Among the many types of ERIEZ equipment for removing unwanted ferrous metal during the processing of chemicals, is the ERIEZ magnetic pipeline trap. Designed with standard fittings for quick installation in 2", 2½", 3" and 4" pipelines, the unit separates iron and steel particles from liquids passing through it. Simple, non-electric, with nothing to maintain or get out of order, these traps are made of stainless steel to resist damage from corrosive chemicals.

TEXTILE—ERIEZ permanent, non-electric magnetic separators are saving textile mills great amounts of money every year, by preventing damage to machinery, ruined clothing, fire and explosion. An ERIEZ magnetic hump installed in the opening room effectively removes dangerous metal from material conveyed pneumatically. The hump breaks up the flow of material, reduces velocity, and allows the magnet to remove the dangerous metal that causes these losses.

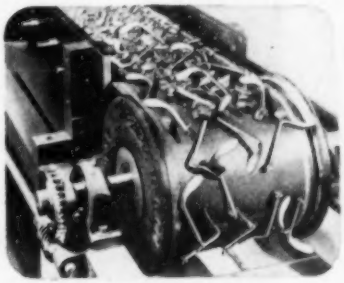
MANUFACTURING—ERIEZ permanent magnetic pulleys for belt conveyors are widely used by manufacturers for the separation of ferrous metal parts from tumbling stones after the deburring and polishing process has been completed. One major American typewriter manufacturer employing this system accomplishes a separation job in ten minutes automatically that formerly took 2½ hours manually. Cost of operation and maintenance of ERIEZ separators is *nothing.*

RUBBER—The limitless industrial uses for ERIEZ non-electric magnetic separators are indicated by this application in the rubber industry: Manufacturers reclaiming rubber find ERIEZ magnetic pulleys quickly and efficiently separate bead wire from rubber stock . . . permanent magnets ahead of attrition mills, grinders, hammermills or installed in spouts and chutes quickly rid the product of iron contamination—as well as eliminate a source of machinery damage and explosions.

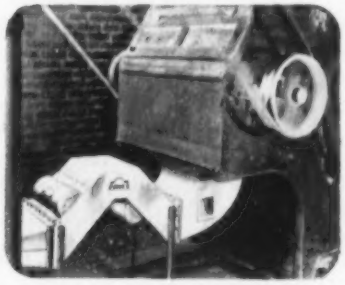


At the Mentholatum Co., U. S. A. this 2" ERIEZ magnetic pipe line trap separates ferrous matter from liquids.

One of eight ERIEZ magnetic pulleys in rubber reclaiming lines, the B. F. Goodrich Company, U. S. A.



An ERIEZ magnetic pulley following tumbling barrel operation, at L. C. Smith & Corona Typewriters Inc., U. S. A.



Magnetic hump installed between bale breaker and vertical opener at the Appleton Company, Anderson, S. C., U. S. A.

ERIEZ INTERNATIONAL

Send for Literature. Address:

ERIEZ INTERNATIONAL CORPORATION

27 Grove Drive, Erie 2, Pa., U. S. A.

Cables: "ERIEZ, ERIE"

Directly serving all industries through expertly trained qualified repesentatives in all principal cities of the world.

new dams and has some under construction. The largest is the Papaloapan project in Vera Cruz state. This project, often called the TVA of Mexico, has as its key the Presidente Aleman Dam, said to be the largest in Latin America. It will be completed this year.

A great power project, the Tingambato project, is now under construction northwest of Mexico City. Being built by U. S. Export-Import Bank funds, it will generate 150,000 kw. The Mexican Power and Light Co., a Canadian concern, also has built a number of new steam projects as well as the largest diesel generating plant in the world at Tacubaya. Mexico's power output is now in excess of 1,400,000 kw.

• **Manufacturing**—Mexico City has several new industrial districts, such as Tlalnepantla, while other industrial areas are growing around Guadalajara in western Mexico and Monterrey in northern Mexico.

Westinghouse Electric Corp. has helped start one of Mexico's new industrial plants, Industria Electrica de Mexico, which is turning out 700 refrigerators a month, plus washers, transformers, motors, and other electrical equipment. Of the 53,000 manufacturing plants in Mexico, about 38,000 are in the Mexico City area.

The big automotive assembly plants, representing nearly every U. S. make including a new Willys plant just opened, turned out 48,975 units last year—a record for Mexico. But they are currently operating under a 30,000-unit quota imposed by the government.

It is impossible to list the industries represented now in Mexico, but they include almost every major firm in the U. S. in the form of branch plants or affiliates. National income rose to over $5-billion dollars in Mexico last year as a result of their output. But the new administration is shifting emphasis from industrialization to agriculture. The reason—62% of the Mexican population work in agriculture but produce only 16% of the national income.

• **Mining**—Mexico, whose most important dollar producer for years has been minerals, is currently finding that mine operators are reluctant to open up new facilities or properties. They are taxed heavily—up to 50% of the value of the ore, as in the case of lead. Further, labor difficulties are increasing; with contracts to be negotiated soon by almost every firm, more trouble is in sight.

• **Agriculture**—Mexico's new hope is coffee. In the last few months, it has risen to be Mexico's leading export, from a dollar viewpoint. Cotton, of which Mexico will grow some 1,500,000 bales this year, is next. Citrus fruits and green vegetables are important for the winter market in the U. S. Some 7,000 carloads of winter vegetables were shipped to the U. S. in one season.

All this growth in Mexico is reflected in the growing middle class in Mexico City. No longer is Mexico a country of the very rich and very poor. In the last few years, the middle class has become the dominant class in Mexico City's population of 3-million. While this is still not true of the country as a whole, the trend is that way. And as the middle class grows, Mexico too will grow economically and politically.

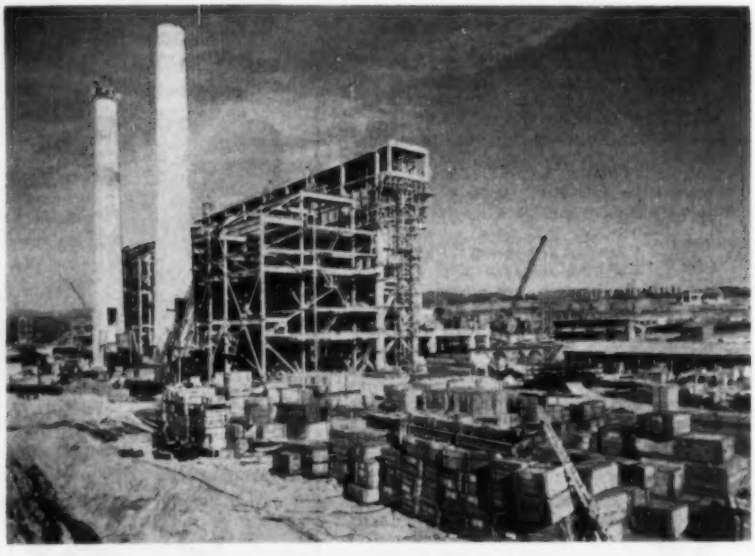
Guided-Missile Gyros Ride on Air Bearings

New type of air bearing for guided-missile gyroscopes has been developed in Switzerland by Roulements à Billes Miniatures S. A.

The vertical rotor shaft of the gyro terminates in a spherical pivot. Compressed air is directed through a series of nozzles into pressure chambers under the pivot and thereby supports the shaft with no metal-to-metal contact.

Pressure chambers, separated by a series of partitions on which the pivot is supported while at rest, are closed by an elastic membrane. Tongues of the membrane act as valves around the circular pivot.

During normal operation, the tongues take up a slightly flexed position. Air then escapes normally between shaft and tongues. When any force deflects the shaft off center, the opening on the other side increases while that on the deflection side decreases. Therefore, air escapes faster from one side, reducing the pressure and drawing the shaft back to its central position.—Mach, Feb 21, p291



More Power for Greece

Aliveri thermoelectric station is one of four power plants being built in Greece through cooperation of five nations. The plants are being built by French, British, Italian and Greek contractors under direction of Ebasco Services, Inc., New York. Capacity of the plant will be 80,000 kw. when completed later this year. Fuel will be lignite. —Elec World, Mar 9, p81

Tricot-Dyeing Method Saves Cloth, Chemicals

Kingsboro Silk Mills, Inc., has taken advantage of an open-width beam-dyeing process for nylon tricot to save time, labor, cloth, and chemicals. A Burlington beam-dyeing machine is the key to the new method.

Gray goods, directly from the knitting machines, are sewed together and wound around the beam, one layer on top of the other. The loaded beam, containing up to 1,600 yd. of cloth, is carried to the dyehouse and hoisted into the machine. Prescour is unnecessary and the low liquor ratio tends also to reduce the number and quantities of dyeing assistants.

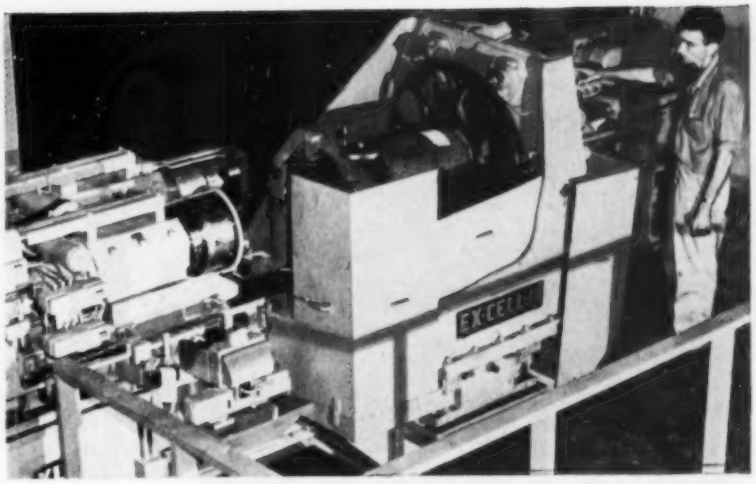
After dyeing and rinsing are completed, the beam is lifted and allowed to drain; then it is placed in a vacuum extractor. The extractor removes excess water and leaves the goods ready for drying and heat setting.

The beam is then rolled to the head of the dryer-heat-setting frame. A nip roll feeds the cloth into a scray from which the pin frame is fed. At the end of the frame the cloth winds on a take-up roll, which in turn serves as a feed roll for the automatic cloth-spreading machine. — Textile World, Apr, p84

Educators Go To Work

Under the direction of the Foundation for Economic Education, 83 colleges and universities will send professors and scholars to work in the offices and plants of American corporations. The program will give scholars an opportunity to match "some of their theories and beliefs against actual experience in business."

Objective is to give the educator a fairly comprehensive picture of the operation of a business firm. This is done largely through interviews with supervisors and top executives. Experience indicates that the educators are primarily interested in such problems as pricing, cost analysis, incentive systems, business research, finance, and industrial and public relations.—Am Business, Feb, p34



It Cost Big Money, But It Saves Time

When Solar Aircraft Co. had to triple output of jet-engine parts without adding floor space, it turned to conveyorized lines, specialized tooling, and high-production machine tools. This machine, for example, is a 19-ton transfer boring and facing machine—the only one of its type made. It cost $90,000 but slashed 87% off the time needed to do all interfal machining on engine aft frames. Made by Ex-Cell-O Corp., the two-station, three-head unit moves 185-lb., 4-ft.-long frames between stations automatically. Complete cycle is 30 min. for all operations.—Iron Age, Mar 26, p129

All-Jute Boxboard

An all-jute board has been developed to meet U. S. government specifications for weather-proof boxboard. This was made possible by a late-type urea formaldehyde resin called Uformite 700 by the maker, Rohm & Haas Co.

The resin increased the wet burst factor of the board from 18 for the untreated jute linerboard to 45 for the treated board. When two outer plies of the treated linerboard were laminated with inner plies of untreated board, the wet Mullen values were 40 to 70 lb. higher than those of untreated board.—Paper Ind, Feb, p1353

U. S. Navy Sinks Oil

A new process for sinking oil slicks with carbonized sand has been demonstrated by the U. S. Navy in waters off Rhode Island. The specially prepared sand is sprinkled on oil slicks, causing them to sink to the bottom and remain there.

The carbonized sand costs the Navy about $20 a ton. Experiments show that slightly less than a pound of sand will sink an average film of Navy bunker oil spread over a square foot.

Carbonized sand is used foundry sand treated with creosote in a rotary kiln at 700°F. When the creosote is burned off, the sand is left with a coating of grayish black carbon that has an affinity for oil.—Eng News-Rec, Feb 26, p23

High-Speed Superfinish

A centerless superfinishing machine, made by Wieck and Heim K. G. of Remscheid, Germany, is claimed to oscillate at 2,000 strokes per min.—several times faster than other similar machines.

The oscillating head is a balanced three-mass system mounted on spring suspensions. A piston, reciprocated by air pressure at 40 to 80 lb. per sq. in., sets a counterweight in motion. The counterweight vibrates a third mass carrying the stones. The high speed of oscillation permits finishes as fine as 0.5 to 1 microinch to be obtained rapidly.

The head can be supplied as an attachment for mounting on a lathe or a cylindrical grinder.—Mach, Mar 21, p480

BUILT as only IH can build them
PROVED as only IH can prove them
VALUE only IH can give you

INTERNATIONAL gives you features you want in these NEW TRUCKS

There are 307 new features to assure you top performance in the new International Trucks. And they're features you can absolutely depend on because they've been *proved* in the world's most advanced truck Engineering Laboratory! *Proved again* on International's 4000-acre desert Proving Ground!

See your International Distributor today. He can show you an unmatched combination of values — an International truck for any job, unequalled performance, lowest maintenance and operating costs, maximum driver comfort. International Harvester Export Company, 180 N. Michigan Avenue, Chicago 1, U.S.A.

Make your next truck an INTERNATIONAL with — Exactly the right power—Diesel engines optional in models rated 14,000 pounds gross vehicle weight and over . . . transmissions to meet any requirement . . . 296 wheelbases, from 102 inches up . . . sizes from 4,200 to 70,000 lbs. GVW rating.

INTERNATIONAL TRUCKS IH

This Month's How To . . .

. . . train new supervisors

Supervisory training program at Carboloy Department of General Electric Co. is divided into three phases. Phase one is a general period lasting 32 weeks. Trainees spend a week to a month in each major department. Phase two—6 months—is spent in the section in which he will work.

Phase three is intensive on-the-job training in which the trainee works as assistant to the man doing the job he is understudying. Under careful supervision, he actually does all the work; for example, if the trainee is slated to be a foreman, he does all the foreman's duties from listening to employee problems to overseeing manufacturing procedure. Later, he will supervise people working on operations such as the one he is shown doing here. —Am Mach, Mar 16, p170

. . . lick the silica problem

These foundry workers at the F. E. Myers & Bro. Co., Ohio, are breathing a finely ground aluminum powder to neutralize an acid formed in their lungs by silica. Aluminum therapy is said to benefit persons exposed to silica dust.

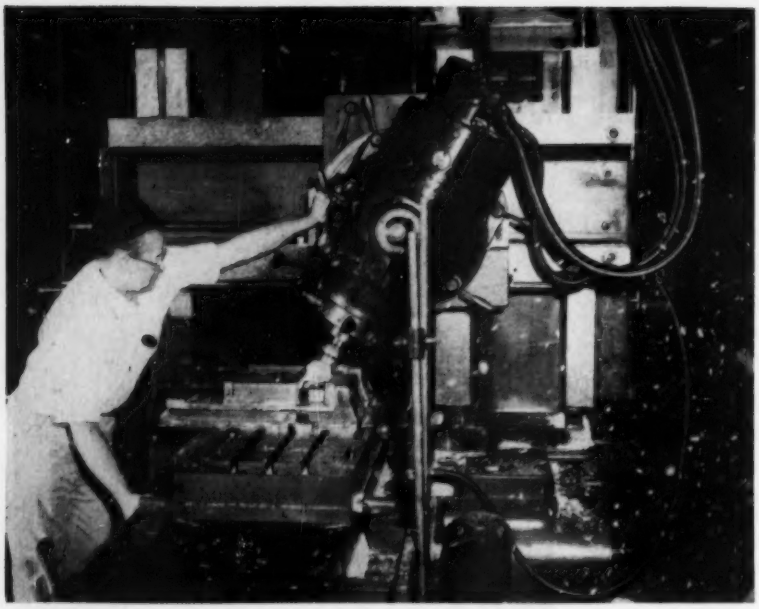
Myers workers are given 16 treatments a year. Doses start at 1 min. and gradually increase to 6 min., but are scaled to individual needs. Myers' therapy equipment was supplied by the McIntyre Foundation, Washington, Pa.—Factory, Apr, p110

. . . tell how it works—with pictures

You can explain more and better, when you sell with pictures. Sager-Spuck Supply Co. sends its salesmen out with a looseleaf binder containing 8×10-in. glossy photographs of installations and product applications it wants them to talk about.

The company gets the pictures from several sources. Sometimes old customers will have snapshots that can be enlarged. Often manufacturers' representatives have them made. As a last resort, the company takes them itself or has them done professionally.

Not all product applications are illustrated. Only those that are particularly ingenious, spectacular, or widely applicable to other customers go into the binder.—Ind Dist, Apr, p153



Miller Previews Machines of Tomorrow

High-speed milling machine developed by Cincinnati Milling Machine Co. for U. S. Air Force removes nonferrous metal at 10,700 rpm. with a feed of 375 in. per min. It can cut a 4-in. furrow in a 48-in. aluminum bar in 8 sec. At this speed, intense heat generated is transferred into the chip, so workpiece warpage is avoided. Spindle has water-cooled bearings and mist lubrication. Attachment loads chips into hoppers.—Am Mach, Feb 16, p201

New Silicone Coatings Now Applied in Color

Silicone coatings in color open up new means of providing decorative coatings on products that have been difficult to coat. Aluminum and black pigmented silicone coatings are applied where resistance to high temperature (over 1000° F.) is a major problem—on exhaust stacks, boilers, engines, stove parts, aircraft components.

Silicone-base vehicles pigmented with other colors are not so resistant to heat as the other two coatings, but they do serve an important use between conventional coatings and inorganic (porcelain or ceramic) materials. These enamels are most useful in the 350 to 1000° F. range.

The heating-stove industry leads in the adoption of colored silicone coatings. Another "stove" application is a heater for an Army vehicle. Finish specifications called for an olive drab coating that would have a 300-hr. salt-spray resistance after being subjected to a heat test of 4 hr. at 500° F. A silicone coating was adopted because non-silicone materials failed and ceramic materials were difficult to handle.

Other uses: black silicone finish on heat-exposed parts of the Lincoln automobile, attractive colors on home electrical appliances, heat-resistant finishes on glass products such as light bulbs and radio tubes, and as a color-coding means for identification on parts where operating temperatures are high.—Prod Eng, Mar, p167

Better Fish Freezing

Experiments by the Boston laboratory of U. S. Fish & Wildlife Service show that equal parts of calcium chloride and glucose in solution improve immersion freezing. Its freezing point (−24°F.) has a lower temperature range than sodium chloride brines. It has low viscosity and is inexpensive.

Taste panels, when served portions of unseasoned, steamed fish frozen in the glucose-calcium bath, were unable to distinguish them from control samples frozen in sodium chloride brine.—Food Eng, Apr, p206

Sea Depths May Provide Power and Fresh Water

At Abidjan, French West Africa, French engineers are taking a step nearer a pet scientific dream—extraction of fresh water and power from the sea. A pipeline to extract cold water from the ocean depths is being laid.

Here is what the French have in mind: temperature of the sea varies with depth, and any temperature gradient is a source of energy. Fresh water, as a by-product of this thermal-differential power, makes the concept even more attractive.

The French have developed an engine to operate on the 40°F. differential at Abidjan. Its boiler would be heated by water from the surface at about 82°F.; its condenser would be cooled by water from the depths at 42°F. The engine—boiler, turbine, and condenser—would operate in a vacuum so that differentials in vapor pressure could be utilized.

There are plenty of problems, but the French engineers are well on the way toward solving them. If the system proves successful, many areas in the world would benefit from both a cheap power supply and adequate fresh water.—Eng News-Rec, Mar 12, p38

Turbine Burns Peat

An open-cycle internal combustion gas turbine has successfully completed its initial test runs at the works of its maker, Ruston and Hornsby of Lincoln, England. The 750-kw. turbine has been built under contract to the Ministry of Fuel and Power as part of the research program devoted to utilization of peat resources.

A system of feeding powdered peat into the combustion chamber has been developed that enables the plant to run as steadily with this fuel as with oil. The plant is now being prepared for prolonged running. The hot exhaust gases are available for drying the peat.

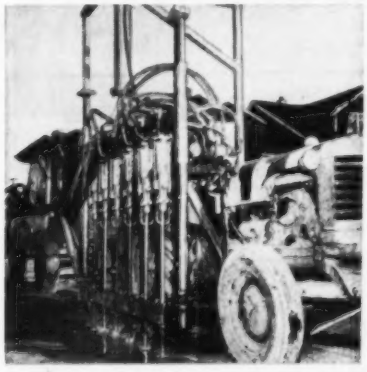
The plan is to run the turbine in association with a special press designed to remove about two-thirds of the water from the raw peat, which contains about 90% water. This allows use of the peat in any season.—Power, Apr, p238

Radio-Controlled Lights May Save Half Million

Awaiting U. S. Federal Communications Commission approval is a novel plan for turning New York City's street lights on or off. Under this new system, coded signals superimposed on a regular broadcast from city-owned radio station WNYC would actuate the lights. The city expects to save most of the $500,000 it is spending on the astronomical time clocks that now control lighting throughout the city.

Functional element of the system is a small radio receiver, about the size of a soup can, with a whip antenna sticking out of the top. The receiver is designed to fasten on a street light, and hook into its circuit.

When the lights are to be actuated, transmitting power at WNYC would be momentarily stepped up and a signal, barely audible to radio listeners, would be sent out on the regular audio-modulation carrier wave. The receivers would react to the signal, and all lights would work simultaneously.—Electronics, Apr, p18



Breaks Concrete Fast

Concrete strip removal is a smooth and fast operation when holes are drilled with a multiple pneumatic rig mounted on a tractor. The R. L. Coolsaet Co. had to cut out concrete pavement strips to make a trench excavation possible. The drill rig used has six Le Roi-Cleveland drills mounted on the side of a Le Roi tractor. Air is supplied by a compressor towed by the tractor. Drills are spaced on 12-in. centers. Water washes out cuttings. A central air cylinder controls feed of drills simultaneously.—Const Meth & Equip, Apr, p43

a sure way

TO GET COST-CUTTING, TOP PERFORMANCE FOR TODAY'S INCREASED PRODUCTION DEMANDS!

Use equipment designed and made with the answer to YOUR problems and YOUR objectives — BUILT RIGHT IN!

How is that done?

By close consultation with you, a thorough understanding of your specific needs . . . a knowledge gained in more than 50 years of producing equipment that has had to perform many jobs — in many ways — under varying conditions throughout the world.

SOME OF OUR PRODUCTS

How we work for you

By the use of our fully staffed Engineering and Research Department. Their everyday job is to see that you — when you buy equipment made by Pressed Steel Car Company — get a product that represents the latest known technological advances in manufacture and utility. The result to you is equipment that is economically more productive . . . *over a longer working life!*

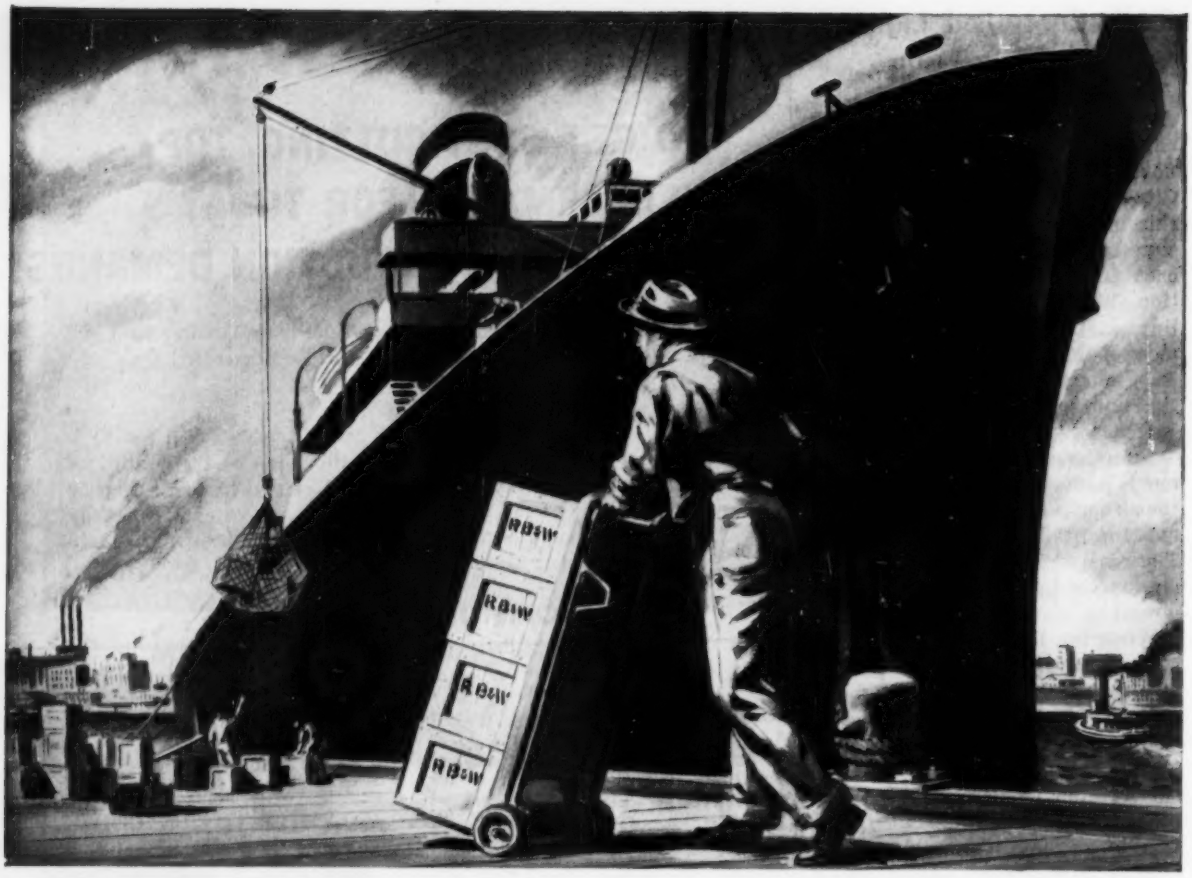
Investigate *our* solution to your problem. Attach a brief outline of your particular requirements to the coupon provided and forward both to the address indicated. There is no obligation, of course.

PSC

PRESSED STEEL CAR COMPANY, INC.
EXPORT DIVISION
25 Broad St., N. Y. 4, N. Y.

PRESSED STEEL CAR COMPANY, INC., DEPT. MGA
25 Broad St., New York 4, N. Y., U.S.A.
Please send me information on the following products:
☐ Agricultural Rwy. cars ☐ Car parts & Trackwork
☐ Industrial Rwy. cars ☐ Brick & Tile machinery
☐ Locomotives ☐ Industrial trailers ☐ Others

Name _____ Title _____
Company _____
Address _____
City _____ Country _____



This shipment is important to world industry

World industry needs RB&W fasteners such as this shipment contains.

For the strength of any assembled product depends on the strength of its fasteners. And today, world markets need the most durable, long-lived products that can be built.

RB&W supplies the finest fasteners from its four plants speedily and easily accessible to any land by rail, sea and air.

It pays to specify RB&W bolts, screws, nuts and rivets, because they hold securely, are made of the proper material for the job, and are easily installed. They are uniformly accurate in threading, uniformly strong in physical properties . . . thanks to strict quality control over every phase of production, from raw material to end product.

Insist on "the complete quality line" for *all* your needs in BOLTS: Machine, Carriage, Lag, Plow, Step, Elevator, Tire, Stove . . . NUTS: Hot Pressed, Cold Punched, Semi-Finished, Castellated, Slotted, Machine Screw . . . SCREWS: Cap, Set, Machine, Tapping . . . SPECIALS: Cold Upset or Cold Formed Products . . . RIVETS.

GET IN TOUCH WITH THESE REPRESENTATIVES

EGYPT—
Shalon Brothers & Co., P.O. Box 716, Cairo

FAR EAST—
Muller & Phipps, 1 Park Ave., New York, New York

GREECE—
Nicholas John Coroneos, Stoa Rizari, Piraeus

IRELAND—
American Exports Co., 30 South King St., Dublin

NEWFOUNDLAND—
James G. Crawford, St. Johns

ISRAEL—
Efco Agency, P. O. Box 1181, Tel Aviv

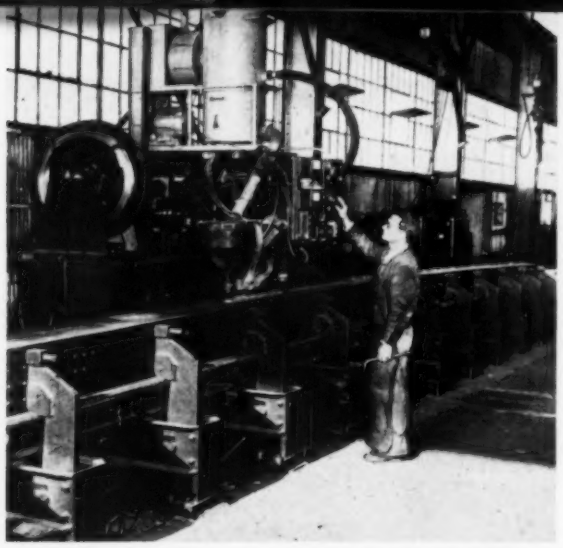
SOUTH AFRICA—
Arthur E. Harris, P.O. Box 1199, Johannesburg

TURKEY—
Leon Bernardin Marco, Posta Kutusu 85, Istanbul

RB&W EMPIRE
For 108 years . . .
The Complete Quality Line

BOLTS EMPIRE NUTS-RIVETS

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY
Export Department • Port Chester, N. Y.
PLANTS AND OFFICES IN MAJOR INDUSTRIAL CITIES



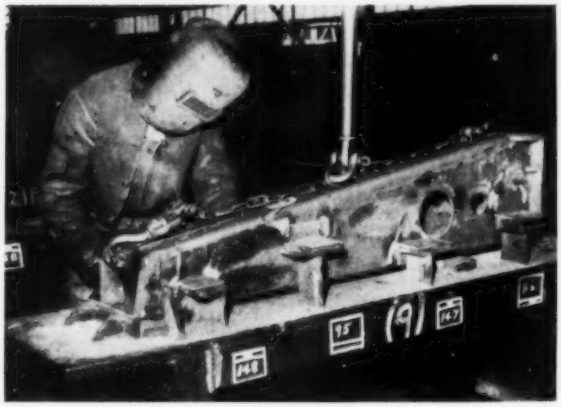
CENTER-SILL Z-BARS are clamped on each side by 13 hydraulically operated arms that bow the bars to proper camber. After tack-welding, bars are welded on a submerged-arc machine at 60 in. per min. Flux feeds from an overhead tank.

Frame Welding

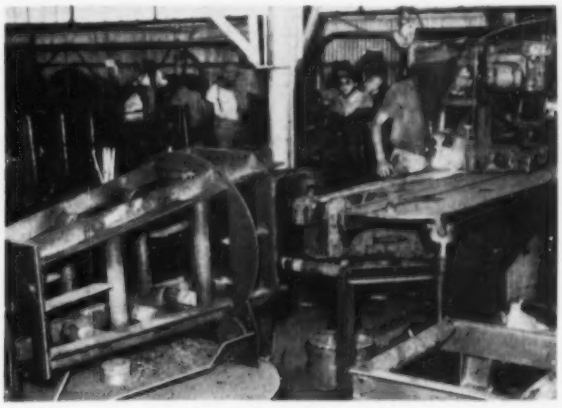
Freight-car underframes are natural jobs for automatic welding methods

HIGHLY EFFICIENT methods have been developed by Consolidated Western Steel Division of U. S. Steel Corp. for fabrication of freight-car underframes. The center sill, the backbone of the frame, is made by joining two Z-bars with submerged-arc welding.

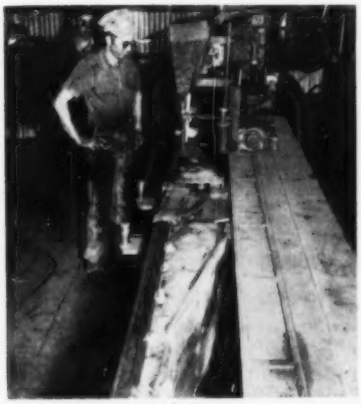
Bolster, cross-bearer, and cross-tie halves are the ribs to the "backbone". Bolster and cross-bearer halves are each made of two formed sections welded together; cross-ties are shaped from structural channels. Cross-members are carried through welding operations on a roller-conveyor system, equipped with turntables, air hoists, and other auxiliary equipment. —Weld Eng, Apr, p39



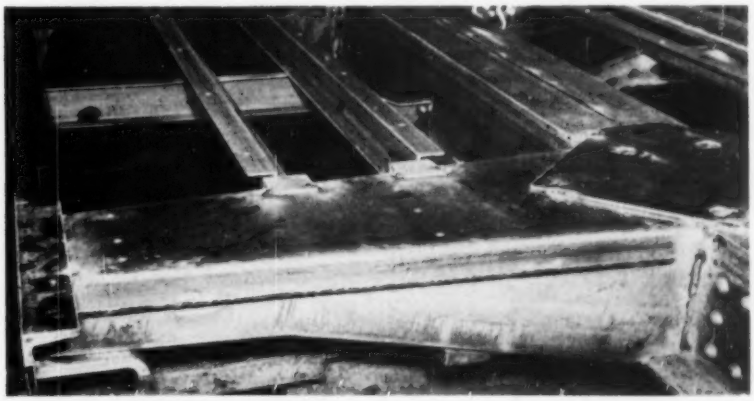
CROSS-BEARER SECTIONS are fitted in a jig, seam-welded on one edge, turned by hand, seam-welded on the other edge, then moved to another jig by roller conveyor and for tack-welding of clips (as shown) and inspection.



MANY FRAME PARTS are heavy and require mechanical help in handling them. This rotary jig is needed to turn the bolster half over after one seam has been welded. The section is then returned to the welder for the second seam.



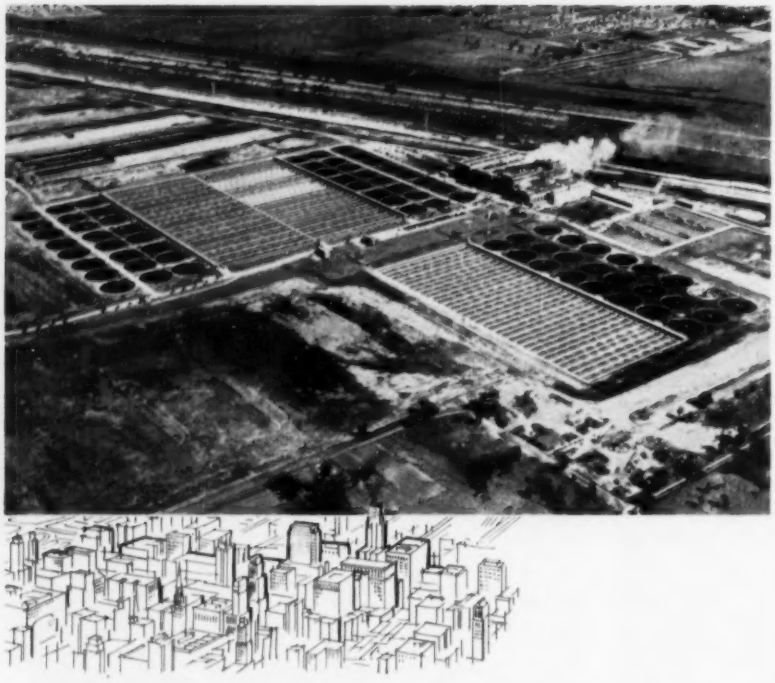
BOLSTER HALVES are welded together in this twin jig. When the weld is finished on the half in the rear, it is turned for welding the other half.



UNDERFRAME END after main-assembly tack-welding has center sill running diagonally from background to foreground; bolster, stringer, and cross-bearer assembled perpendicular to center sill; and longitudinal stringers and side sills parallel to center sill. Final welding is done down-hand on a rotary positioner.

CHICAGO "DOES IT AGAIN"

...now treats 900 MGD at West-Southwest



Treating sewage for the Chicago Metropolitan Area is big business. So big, in fact, that the West-Southwest Sewage Treatment Works is the largest activated sludge plant in the world. And this is but one of seven plants operated by The Sanitary District of Chicago.

Latest additions to the plant are the 24 Dorr Clarifiers shown in the right foreground of the photograph. These units (each 126′ dia.) are identical in type and design to the Dorr Clarifiers previously installed. Today, a total of 72 Dorr units at the West-Southwest Works have a combined average capacity of 900 MGD.

Whenever a process involves the separation of finely divided solids in suspension, the use of ion-exchange, or fluidizing techniques, Dorr and its Associated Companies throughout the world can provide the correct equipment for your job. THE DORR COMPANY, Stamford, Conn.

Better tools TODAY to meet tomorrow's demand

DORR

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

Offices, Associated Companies or Representatives in principal cities of the world.

New Method Cuts Costs in Mining Low-Grade Ore

Pend Orville M. & M. Co., British Columbia, reports a drop in operating costs since vertical slicing by sub-level long-hole benching was adapted to mining the low-grade, lead-zinc orebody. This method replaced the removable horizontal-pillar and horizontal-open-stope mining with slushers.

Conditions influencing the change include:

1. Firmness of ore and rock.
2. Remarkable continuity of ore over vertical range.
3. System permits breaking more ore than is drawn.
4. Slushing is required only to remove broken material from sub-level drift.
5. A larger tonnage is broken per foot of drill hole.—Eng & Min J, Apr, p100

Chemical Notes Abroad

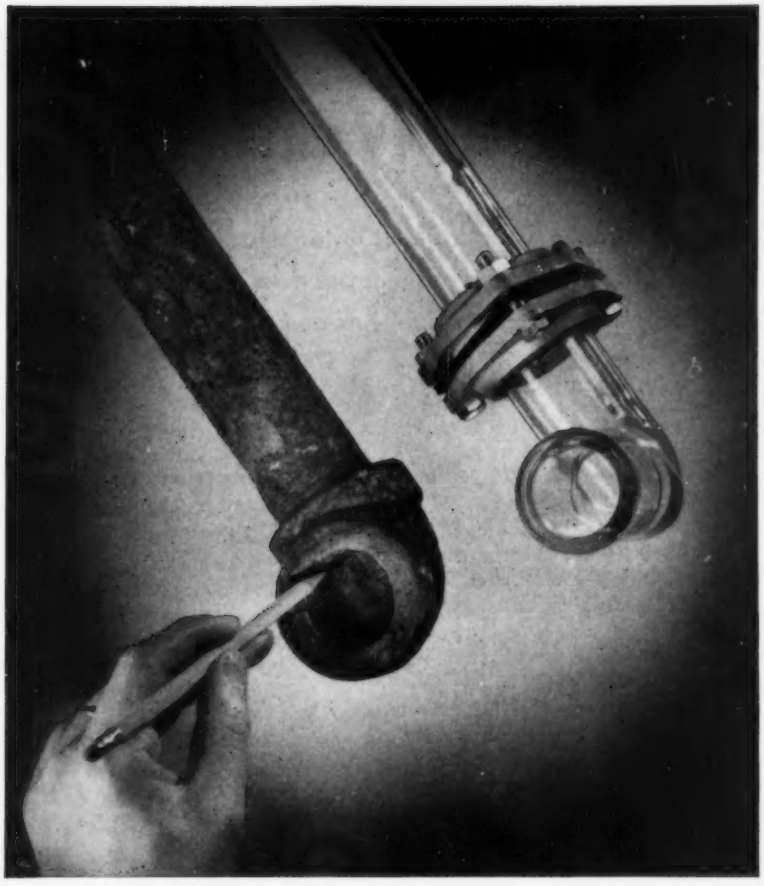
▶ **Holland**—Enough soda for export as well as domestic needs will be made in a 60-million-guilder soda manufacturing plant to be built near Delfzijl this year. Holland now imports most of its soda needs from France.—Chem Wk, Feb 21, p20

▶ **Brazil**—Pacific Vegetable Oil Corp. of San Francisco is studying the possibility of expanding production of oil from Babassu kernels. The company has its first experimental nut-cracking and extraction plant in operation in the Amazon River area.—Chem Wk, Feb 28, p32

▶ **India**—Government-owned plant in Alwaye, Travancore Cochin, will process 1,500 tons of monazite sand per year. Main products: rare-earth chlorides and carbonates. By-products include thorium nitrate and uranium compounds.—Chem Wk, Mar 7, p27

Free Reader Service

As a special service to our subscribers, the McGraw-Hill Digest will furnish without any charge additional information about any new business or technical development described. Address your letter to: The Editor, McGraw-Hill Digest, 330 West 42nd St., New York 36, N. Y., U. S. A.



You've never seen rusty glass

Here is a simple demonstration of one reason why chemical, food and many other industries with corrosive fluid-handling problems are using glass pipe, glass heat exchangers and other plant equipment made of glass. It does not rust.

Glass also protects sensitive products from contamination. Its sparkling transparency is permanent. It's easy to clean. It's heat resistant. It can be designed to match a great variety of application requirements.

Those are some of the reasons why glass is an ideal material for products for both home and industrial use. It may well be the material you need for your product or plant.

Learn more about this versatile material and how it might help your business. Send today for a copy of the 12-page illustrated booklet, "GLASS, its increasing importance in product design."

CORNING GLASS WORKS
119 West 57th Street, New York 19, N. Y., U. S. A.

Corning means research in Glass

Glass insures true coffee flavor. Smooth surfaces will not retain coffee deposit. Sparkling transparency adds sales appeal.

Chemists depend on the stability of Corning laboratory glassware for maximum protection of highly corrosive or sensitive chemicals.

EASY CLEANING, transparency and heat resistance make attractive Corning Flameware the favorite of housewives the world over.

CORNING GLASS WORKS
Export Dept. 6A
119 West 57th Street
New York 19, N. Y., U. S. A.

Please send me your 12-page illustrated booklet, "GLASS, its increasing importance in product design."

Name_____
Title_____
Company_____
Address_____
City_____
Country_____

G43

What You Need to Know . . .

When You Handle Women

Women take things personally; their logic is often illogical; they like to gossip—these mean headaches for the male supervisor. This special Digest article tells you what one woman says about her own sex

THE SAME RULES for supervising men do not hold when you try to apply them to women. If you want to be a success at supervising women, you will have to:

- Recognize in what respects they are different from men.
- Treat them accordingly.
- And not let them know it.

The phrase "opposite sex" accurately describes women. And most women—whether they admit it or not—want to be treated as the opposite sex.

They know that they are different in many ways. Men still claim the role of "achievers" in spite of the democratic relationship between the sexes today. That is why women in business take a back seat or drive hard to "prove themselves."

"THE CAREER WOMAN feels she can handle her job like a man."

Keep this in mind, too. Physically, women differ considerably from men. They can take quite a bit of punishment, but they have physical and emotional limits designed for them by nature. Women cannot take long periods of standing. And they cannot take extended pressure or long, unbroken periods of constant activity.

You have to be careful when you criticize women. They "take things personally." One psychologist illustrates it this way:

Ask a man, "Where did you buy this meat?" and he'll answer, "At Green's Meat Market."

Ask his wife the same question, and she will answer, with some emotion, "Why? What's wrong with it?"

In the business world, such reactions are due partly to the fact that women are on the defensive. It is partly the feeling that as a group they have to prove themselves, but it is mostly that a woman tends to see almost everything in terms of herself.

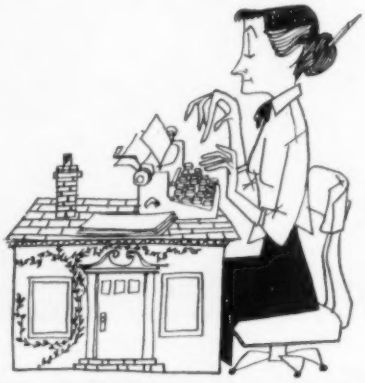
It means this: when you discuss her work, she is likely to think that you are discussing her. Not many women realize that you can consider her work separate and apart from her as a person.

Of course you cannot protect your women employees from every slight, real or imaginary. But because they are so sensitive, it is even more important in dealing with them than with men to follow the rules of criticism-and-praise:

- Criticism should always be closely linked with encouragement and appreciation.
- Never take a woman for granted. Your failure to comment favorably is likely to be interpreted as disapproval.
- Women expect praise in greater quantities than do men.

You will have trouble if you try to fathom a woman's logic. And it is a mistake to tell her she is being illogical. As far as she is concerned, the way she feels about something is in itself a compelling argument. No matter how strange and wonderful her conclusion, to her it is "perfectly logical."

Sometimes, "women's intuition" keeps them one jump ahead in their thinking. It should not mystify you. The fact is that women are extra sensitive to other human beings, observe them carefully, and "feel" their moods.



"THE OLD MAID substitutes her job for the average woman's life-purpose."

While the average man concentrates on the job at hand, the woman working with him is also interested in how he is affected by the job and, indirectly, how she is affected by him. The simple truth is that people interest women.

Women do gossip—because they are intensely interested in people. And talking about others is a by-product of that interest. If your type of work allows it, give the women an opportunity to talk together frequently. Statistics say that women work better and produce more if they can socialize.

To some extent, all human beings behave as they think others expect them to behave. Women, in particular, usually conform to the general behavior pattern, because most of them are afraid of being considered different—or peculiar.

That they are conformists is a fact that should be of the utmost

importance to anyone who works with women. It can be put to advantage in dealing with women.

The first piece of information you want about a group of women employees is who among them is the "style-setter." Once you have that information, you are in a position to influence the group. No matter what the problem may be, make sure that you get her support. But be sure to address yourself to everybody in the group as well as the "style-setter." Use her to back you up, but remember that all the women are concerned with your attitude toward them as individuals.

Many different types of women exist—as many as there are types of men. But a given woman falls into a general classification only in the roughest sense. Broad generalizations can be useful, however, if you use them right. They can serve as general guides. Here is a look, from the viewpoint of the supervisor, at several types.

I. The Career Woman

She is really convinced that she wants to get ahead on her own. She feels she can handle her job as well as—or better than—any man. She would be the first to deny that she needs a man's help.

Biggest danger in handling her: Taking her at her own evaluation—she thinks she does not want expressions of approval from men.

Most important measures in dealing with her:

1. You should not let her show of hard-headed independence deceive you. Your words will give her more pleasure than she is willing to admit.
2. Indicate goals ahead that she is capable of achieving.
3. When she makes errors, your correction should be low-pressure.

II. The Old Maid

Not every unmarried woman falls into this category. The difference is this: the old maid would prefer marriage to work. Not having a family, the old maid substitutes her job for the average woman's life-purpose. So she is usually loyal.

Biggest danger in handling her: She may annoy the other employees who are not so completely concentrated on their work as she is. This can happen in two ways: (1) she may be very critical of her younger co-workers or (2) she mothers them

"THE MARRIED WOMAN stays on the job because of family needs."

and "sacrifices" herself to help them.

Most important measures in dealing with her:

1. Watch her relations with her fellow-employees.
2. Where possible, give her extra assignments. This is one case where other women are not likely to be jealous of your relationship with her.
3. You can expect steady performance over long periods of time, but she will have sudden fits of depression during which the quality of her work falls. Avoid criticism at this time.

III. The Mature Married Woman

The married women referred to here are those who are planning to stay on the job indefinitely either because their children have grown up or because the family depends on her earnings. This type of woman, because of her maturity, has a real sense of responsibility. And she does a steady efficient job with little supervision.

Biggest danger in handling her: As she is holding down two jobs—at home and at work—she has her own particular problems. Her other responsibilities may keep her from her work at times.

Most important measures in dealing with her:

1. In giving orders and instructions, be careful not to overburden her with unnecessary details. She has no small skill in running things.
2. In assigning overtime work, you should try others first.
3. Encourage her to come up with suggestions. Her experience can pay off with good ideas.

In all three types, problem situations will appear from time to time if you work with women. The most frightening experience you are likely to come up against is the flood of tears let loose without any warning.

You can do this:

- Give her an opportunity to recover her self-control.
- Let her know that you are available to discuss anything she wants to bring up.
- To the extent that she blames you for her outburst, explain the situation in detail.

Finally keep in mind the fact that some women use tears as a deliberate weapon. Better not yield. Whatever happens, you have to maintain your standards—undiluted by the tears.

Favoritism is suspected quicker by women than by men. When a supervisor gives a lot of attention to a girl, the other women may see personal motives behind it.

One supervisor had spent some time with a newcomer who was having trouble getting started. The other girls resented it. A whispering campaign reached him.

"That did it!" he says. "From then on I did my best to give them little individual attention."

That was wrong. Ignoring people will not keep you out of trouble. You should show the same friendly willingness to help each one.

No doubt about it, sometimes women move in mysterious ways. They are alternately a joy and a sorrow to the average man, who frequently wishes he could predict which it will be at a given moment. But the average woman is predictable to this extent: if she feels that she is being treated fairly and that you recognize and like her as an individual in her own right, her gratitude will show up in her cooperation and real application to the job at hand.—Digested from "How to Handle Women" published by the Research Institute of America, Inc., consultants in management methods.

Your Best Buy in HEATING COMFORT

HEIL

AUTOMATIC HEAT

HEIL heating units are designed to put modern, automatic heating comfort within the reach of everyone. When you choose Heil Automatic Heat, you're sure of quality equipment, soundly engineered and built with every desirable feature for efficiency and economy, plus years and years of dependable service for healthful comfort in your home.

CHOOSE YOUR HEATING EQUIPMENT FOR:

- **COMFORT** throughout the house is assured by Heil *uniform* heating. There's no "off-and-on" feeling, no chance for warm air to collect near the ceiling so that your head is too warm while your feet are cold.
- **FUEL ECONOMY** is built into Heil warm air units. The money you save in fuel can help you pay for the whole new heating system in a few years. With Heil burners there are no sooty flame tips, no roaring fire that wastes heat up the chimney.
- **HEATING EFFICIENCY** depends upon the size of your home, its location, window area, and other factors. Each home has its own *individual* heating requirements. The wide variety of oil or gas fired heating units in the extensive Heil line is your assurance of meeting your individual requirements efficiently and economically.
- **LONG, TROUBLE-FREE LIFE** . . . Most heating units look alike at a casual glance, and it's difficult to judge quality from appearance alone. It will pay you to look for the famous Heil quality trademark to be sure of heating equipment that is built to give you long years of dependable, trouble-free service.

You'll want to know more about Heil Heating Comfort for your home. Write today for the name of your nearest Heil distributor.

OPPORTUNITY FOR NEW DISTRIBUTORS

There are still a few choice Heil distributor franchises open . . . it's your opportunity to meet the demand for better automatic heating units with a profitable, diversified line of oil or gas fired warm air heating systems and steam and hot water complete heating units and conversion burners. Write for complete details of this valuable distributor franchise.

Modernize Old Heating Plants With Heil Conversion Burners

If you now have an old or inconvenient heating plant, or if you now burn coal, you can change to comfortable, convenient, automatic heat quickly and easily. Heil Conversion Burners quickly adapt existing heating plants to either oil or gas burning units and assure greater heating comfort, trouble-free operation and maximum economy.

THE HEIL CO. EHTG-1

Established 1901

Export office: 3000 W. Montana St., Department C63
Milwaukee 1, Wisconsin, U.S.A.
Cable Address: HEILCO, Milwaukee, Wis., U.S.A.

How To Get More From Labor-Turnover Reports

Too often, labor turnover reports are cold sets of statistical data. They worry executives, but they offer no clues to improving the situation.

A solution that is simple and effective was developed by Taylor Instrument Cos. Regular statistical reports are supplemented by a name-by-name listing of all employees who left with 5 or more years service. Taylor also listed the recorded cause of separation, date of last pay increase, and pay rate at time of leaving.

By thus personalizing turnover, the company feels it gets real thought as to preventive action in future cases. Supervisors are encouraged to analyze the reports with the personalities in mind to discover what caused the turnover and as a basis for recommending constructive policy changes.—Factory, Apr, p128

Broaching Practice

Years of experience in tackling the toughest of broaching problems have been incorporated in a new 80-page manual, Broaching Practice. The manual is broken down into 15 chapters, covering applications and types of broaching, material brochability, broach design and auxiliary equipment, fixtures, broach maintenance, machine setup, broaching troubles, and case studies.

The chapter on broaching troubles and how to correct them will be of particular value to everyone connected with broaching operations. For instance, it tells what causes those streaks on broached surfaces and how to avoid them. Executives and other key personnel in metalworking plants can obtain free copies by writing to: National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.

Stabilizes Wet Ground For Deep Excavation

Near Bay City, Mich., electro-osmosis changed a saturated, unstable silt deposit into stable, dry soil that could be excavated without protection of sheeting. Wellpoint Dewatering Corp. installed two sets of wellpoints along the perimeter of the excavation. But the saturated silt could not be dewatered with this method. So Wellpoint Dewatering tried the electro-osmosis method.

It converted the wellpoint system into an electro-osmosis system by utilizing wellpoints as cathodes. In between these points, the firm drove pipes as anodes. Motor-generator sets furnished direct current at 80 volts and low amperage to the system.

In a short time, water began to dribble out of the wellpoints and to bubble out at the surface around the points. In 3 or 4 days, the quaking, saturated silt began to solidify into a stiff sandy-clay formation.

A simple description of how it works is this: the current forces the water out of the capillaries and drags the hole in behind it. A more precise explanation involves higher mathematics.—Const Meth & Equip, Apr, p52

Cuts Germanium Cost

Addition of processing facilities to the Omori plant of the Tokyo Gas Co. in Japan will make possible the production of 100 grams of pure germanium a day from waste liquid, at about half the cost of present U. S. production methods. This and other Japanese pilot-plant installations now underway are expected to produce over 200 lb. of the precious metal this year. Present world output is only about 3 tons a year.

Black sediments are filtered out of the waste liquid, heated, and burned with tar to get a reddish powder. Chloric acid is added, and the powder is distilled to get germanium tetrachloride vapor at 85°C. Running this through water gives white germanium oxide, which, when mixed with hydrogen gas at 900°C., gives 99.99% pure germanium.—Electronics, Apr, p8

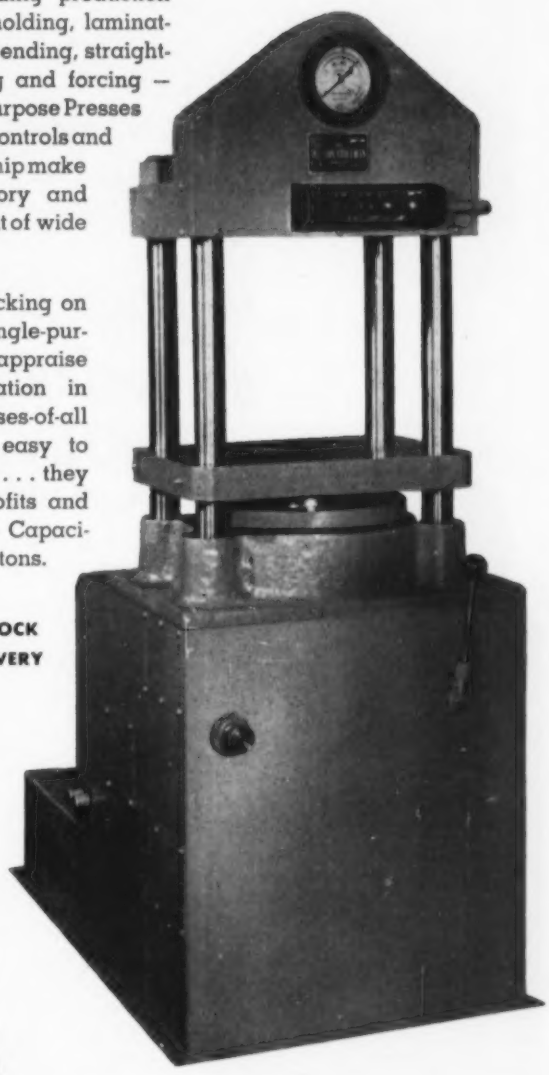
FOR ALL-AROUND VERSATILITY...

WATSON-STILLMAN

GENERAL PURPOSE PRESSES

For anything including production runs — in plastics molding, laminating, metal forming, bending, straightening, light hobbing and forcing — these W-S General Purpose Presses can't be beat. Their controls and precision workmanship make them ideal laboratory and production equipment of wide application.

If you're taking a licking on short-runs with single-purpose machines, re-appraise your overall operation in terms of these presses-of-all work. Economical, easy to set-up and maintain . . . they add up to more profits and uniform production. Capacities: 30, 50, 100, 200 tons.



AVAILABLE FROM STOCK FOR IMMEDIATE DELIVERY

W-S HYDRAULIC

ESTABLISHED 1848

Write today for Bulletin Sheet 370-D—Export Dept.

THE WATSON-STILLMAN COMPANY

DIVISION OF H. K. PORTER COMPANY, INC.

ROSELLE, NEW JERSEY

9-0-68

W-S MAKES MORE TYPES AND SIZES OF HYDRAULIC MACHINERY THAN ANY OTHER COMPANY

IF YOU DO BUSINESS ABROAD

it pays to do business with **Chase**

Chase's Foreign Department is staffed with specialists in every phase of foreign trade. These men work in groups—each group handling the bank's business in one particular trading area. As a result, customers' interests in any foreign market receive the attention of men who are thoroughly familiar with trade developments and ways of doing business in that particular part of the world.

If you do business abroad, why don't you talk to the people at Chase?

THE
Chase
NATIONAL BANK
OF THE CITY OF NEW YORK

HEAD OFFICE: Pine Street corner of Nassau

Member Federal Deposit Insurance Corporation

OVERSEAS BRANCHES • London • Paris • Frankfurt/Main • Tokyo • Osaka • Havana • Marianao • San Juan, P.R. Santurce • Panama • Colon • David • Cristobal • Balboa

Offices of Representatives • Mexico, D. F. • Buenos Aires • Rome • Beyrouth • Bombay

TECHNICAL SHORTS

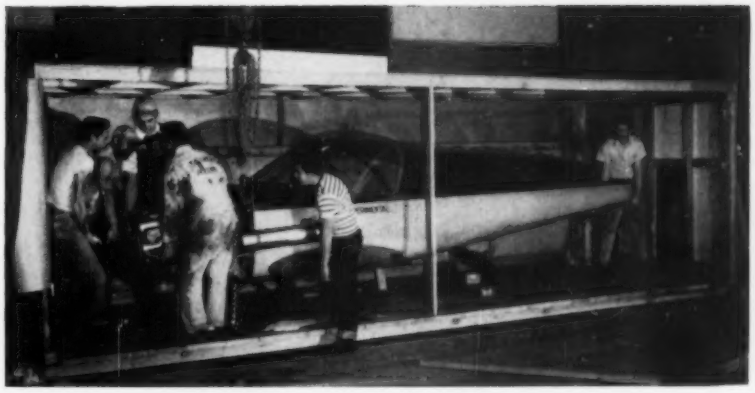
Stripping New Fibers—Two simple procedures have been found effective in stripping color from dyed hydrophobic fibers: (1) physical removal of color by means of large volumes of dilute soap solutions and (2) chemical removal of color with sodium chlorite.—Textile World, Apr, p308

Atomic Sterilization — National Canning Association says that gamma rays in fission products will have to be 1,000 times more intense than today's 1,000- to 5,000-curie level before they can be used for food sterilization. NCA also said problems of side effects on color, flavor, and odor will have to be overcome before atomic sterilization of food can become practical.—Food Eng, Apr, p239

Atomic Protection — Passenger cars used in Yucca Flat, Nev., atomic-bomb tests proved that automobiles offer good protection. Cars 1½ miles from bomb center showed little damage if windows were partly open. They started immediately.—Auto Ind, Apr 15, p21

Better Than Words

Why waste time with a lot of words to describe the sequence of samples taken from a drill hole, when you can mount the actual rock samples on boards such as those shown here? This system of visual logging is in use at the Caselton operations of Combined Metals Reduction Co., Nev. Rock particles for 5-ft. sections are mounted in sequence on the boards.—Eng & Min J, Mar, p116



Light Support Plane For Japan

Fletcher FD-25 Defender, light tactical support plane, is pictured being boxed for shipment to Tokyo, Japan, where it will be used as a demonstrator and to aid in production of the plane by Tokyo Airplane Co. Plans include checking out Japanese pilots in the plane. The little F-25 is designed to take off in 500 ft. with full load and land in 330 ft. Climb is rated at more than 1,000 ft. per min. —Aviation Wk, Feb 16, p7

New Acrylic Process—Rohm & Haas Co.'s new $8-million plant near Houston, Texas, is making acrylic monomers from acetylene. Reaction with acetylene is started with nickel carbonyl; carbon monoxide is then fed in. Process results in lower production costs. —Chem Eng, Apr, p114

On Ice—Dominion Drilling Co. in Alberta, Canada, set up a drilling rig on frozen Beaverkill Lake. Rig heat was kept from melting the ice by spreading 10 in. of sand and topping with matting. The company also ran in 30 ft. of 30-in. pipe and cemented in a 20-in. pipe to provide a dead air space and avoid melting ice near the top of the hole.—Oil & Gas J, Mar 2, p33

Cheaper Alcohol—British Petroleum Chemicals Ltd. is making synthetic ethyl alcohol by direct catalytic hydration at its plant at Grangemouth, Scotland. Alcohol is supposed to be 7 to 8¢ per gal. cheaper than fermentation alcohol from Cuban molasses.—Pet Proc, Apr, p453

Wind Drives Turbine—The Enfield 100-kw. wind-driven generator being built for British Electricity Authority has hollow propeller blades. The blades will draw air by centrifugal action from the tower, thus setting up a pressure differential across an air turbine and causing it to rotate and drive an alternator.—Mach, Feb 28, p361

"Non-oil" Lube Oil—Standard Oil Co. (N.J.) has announced a lubricant for jet and turboprop engines that is light, cannot boil away, will not decompose. Major component is di-iso-octyl sebacate. Usual additives are not used. Future competition with mineral oils is possible.—Chem Wk, Apr 11, p46

Tracer Spots Jams—A disk of paper soaked in radioactive cobalt is fastened to each of 200 mailing carriers in Carborundum Co.'s 8,000-ft.-long pneumatic tube system. When jams occur, they can be quickly located by checking the tube with a Geiger counter. Slight radioactivity is not dangerous to workers.—Iron Age, Mar 26, p156

Waste Report

MILL NO. ..... Week Ending .....

Type waste	Shift	Pounds for week	Percent	Accum. pounds	Percent to date	Standard
WARP	1	52	.06			
	2	66	.08			
	3	67	.08			
Total warp		185	.08	4,184	.066	.064
FILLING	1	101	.13			
	2	13	.09			
	3	27	.03			
Total filling		201	.08	6,122	.096	.079
RAGS	1	52	.06			
	2	35	.04			
	3	13	.01			
Total rags		100	.04	3,392	.053	.028
TOTAL SWEEPS		1,471	.65	38,556	.60	.66

TOTAL FOR MILL ALL SHIFTS —

	Pounds for week	Percent	Accum. pounds	Percent to date	Standard
WARP WASTE	728	.09	21,469	.085	.058
FILLING WASTE	1,054	.13	36,132	.14	.09
RAGS	345	.04	10,620	.042	.028
SWEEPS	5,616	.76	159,847	.63	.62
QUILL STRIPS	4,418	.56	137,535	.54	.45

WASTE WAS TOO HIGH on weekly report, so mill started program to . . .

Cut Yarn-Waste Costs

If your yarn-waste costs are too high, you will want to know how to reduce them. One mill saved $4,000 in 2 mo. They did it this way

WARP-WASTE SAVINGS in the weave room begin in the slasher room. The warp beams should be kept smooth and free from splinters or rough places.

Full warps are stored separate from empty beams, so removal of empty beams will not damage full warps. The floor area around the stored beams is kept smooth to prevent truck wheels from skidding beams and thus damaging them.

Warp trucks for transporting full warp beams from the slasher room to the weave room or tie-in room are kept in good condition. Trucks are padded on top to prevent damage to the warp beam.

Tying-in machine operators should pull just enough warp off the beam to straighten out the ends to tie them. The knots are pulled through the reeds only enough to tie the warp to the warp apron on the loom. When warps run out, the weave-room second hand initials or stamps the cloth at the beat-up to show that the warp is completely out.

All bunches on bobbins are built alike so that a minimum bunch is left on the bobbins at the loom. Most sizes of filling will take 5½ picks.

Tension on spindles is controlled to prevent soft-wound bobbins. Proper spinning-room practices also require the doffing of bobbins before they are filled too full.

The battery hand places battery waste and tails that are pulled from full bobbins of filling into containers that are placed throughout the weave room. The battery hands also flag looms that are changing pieces so that the loomfixers can fix the looms.

The loomfixer fixes the battery each time the transfer hammer breaks a bobbin. He also keeps the lugs set high to prevent sloughed filling. The little extra effort these measures require take little of the employee's time, but it will pay off in reduced costs and bigger profits.—Textile World, Apr, p106

Novel Recording Device Shrinks Time Up To 50%

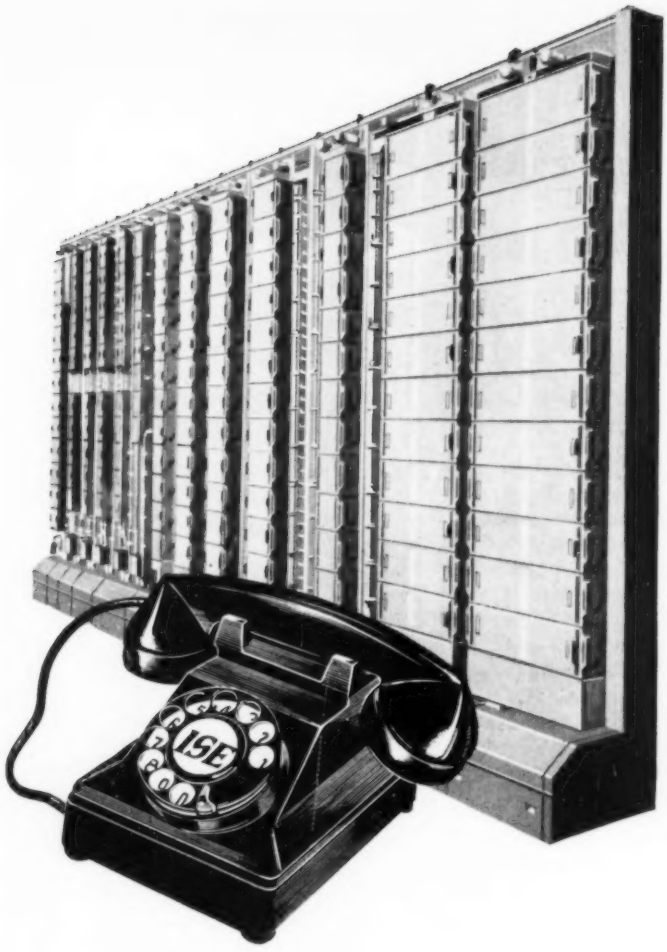
Interesting new machine invented at the University of Illinois can shrink speech or music up to 50%, figuratively compressing time. A 10% shrinkage sounds no different than normal to human ears. The 50% shrinkage is noticeable, but the listener can still understand what is being said.

What the machine does is to cut out "temporal redundancies" or prolonged and non-essential sounds. To do this, the original recording is run on a revolving drum with four magnetic-tape pickup heads that take apart and shaveoff a certain portion of each syllable or letter. Then they are put back together on another tape. Reversing the process makes it possible to expand sounds and thus "lengthen time".

One possible use for the device is in radio where programs could be tailor-made—let out here, taken in there—to fit the time allotment. —Electronics, Apr, p14

Safer Deck Bridges

Serious automobile accidents often occur from skidding on steel deck bridges. They now can be made safer by a surfacing method developed by Illinois State Highway Department. Studs are end-welded on 12-in. centers to the steel grid, and a heavy diamond steel mesh is laid over the studs. Bending the studs over holds the mesh, over which the black top is laid.—Weld Eng, Mar, p6

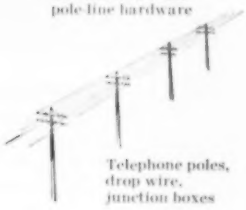


Microwave radio relay systems

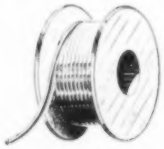
Switchboards, test boards

Insulators and all pole-line hardware

Telephone batteries and standby power supplies


Telephone poles, drop wire, junction boxes

Teleprinters


Wire and cable for every purpose

Carrier wire transmission systems

EVERYTHING...behind your telephone

Modern automatic dial telephone exchanges—for communities of any size from the largest to the smallest—are provided complete to the last detail by ISE. But ISE service goes far beyond that—covering every conceivable need of a modern communications system. Included are such specialized equipment as microwave point-to-point links, carrier and other multiplex systems and teleprinter networks—as well as the telephone wire itself, the poles on which it is strung and all the tools, accessories and materials required. Look to ISE for everything—everything behind your telephone.

ISE
An IT&T Associate

International Standard Electric Corporation

67 Broad Street, New York 4, N. Y., U. S. A.

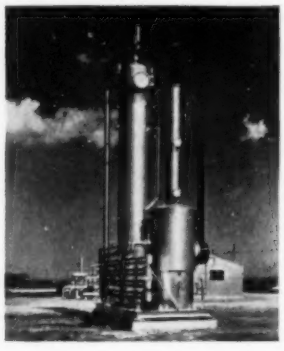
Equipment and supplies for automatic and manual telephone and telegraph systems . . . radio communication . . . television and radio broadcasting and receiving . . . radio aids to navigation . . . airports . . . light and power . . . signalling systems.

FACTORIES IN SOUTH AMERICA: Cia Standard Elec. Argentina, S.A. Ind. y Com., Buenos Aires, Argentina
Standard Electrica, S.A., Rio de Janeiro and São Paulo, Brazil • Cia Standard Electric, S.A.C., Santiago, Chile

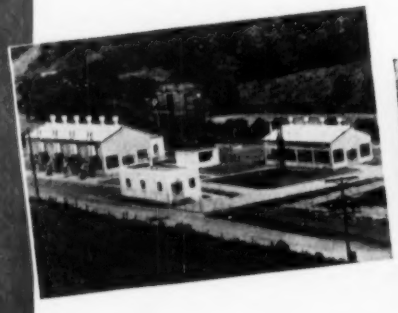
CHEMICAL PLANTS DIVISION

offers these types of plants and equipment to the Oil, Gas, and Process industries

- Catalytic Cracking Plants
- Caustic Soda and Chlorine Plants
- Chemicals from Petroleum
- Compressor Stations
- Dehydration Plants
- Desulfurization Plants
- Distillation Units
- Extraction Plants
- Fat Splitting
- Fatty Acids
- Fatty Oil Refining
- Fischer-Tropsch and Oxo Plants
- Fractionation
- Gas Cleaning Equipment
- Gas Dehydration
- Gasoline Plants
- High Pressure Processes
- Liquefied Gas Storage
- Low Temperature Gas Separations
- Package Gasoline Stripping Plants
- Petrochemical Processes
- Plant Surveys
- Process Plant Construction
- Recycling Plants
- Resin Manufacturing Plants
- Solvent Recovery
- Special Refining Processes
- Synthetic Fuel Plants
- Synthetic Organic Chemicals
- Tonnage Oxygen Plants



Here are some examples of complete plant units designed and constructed by Chemical Plants Division for the specific requirements in the Oil and Gas industry. For each of these, the customer came to us with a particular problem that he wished solved. We engineered an economical solution for him and built a successful plant. We welcome the opportunity to do the same type of work for you.



BLAW-KNOX COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A.

ADDRESS...EXPORT DEPARTMENT
SECTION 2028, CHRYSLER BUILDING, 405 LEXINGTON AVE., NEW YORK 17, N. Y.
Cable Address: Blawknox, N.Y.

Atoms for Power

Proposed new policy of U.S. Administration gives industry the right to develop atomic power

PRESIDENT EISENHOWER has agreed on a new atomic policy that will permit business—if Congress accepts it—to develop the atom for making electricity and for other commercial uses. Opposition in Congress is likely to come from groups that still feel that the atom must be kept secret as long as there is a weapons race on between the U.S. and the Soviet Union.

Main points of the new program would:

- Permit private companies to be licensed to obtain uranium in sufficient quantities to produce electricity. Also permission for licensing of private companies to produce fissionable materials.
- Provide for government long-term contracts with industry for purchase of fissionable materials used in making bombs.
- Change the law so that private companies' research and development would have some patent protection—though not outright—and provision for sharing of such developments with the rest of industry on a license basis.

Even if Congress does approve this program, the use of atomic power in industry is a long way off. The atomic plant that would produce power anywhere nearly competitive, costwise, with power from coal, oil, gas, or falling water has not yet been designed.

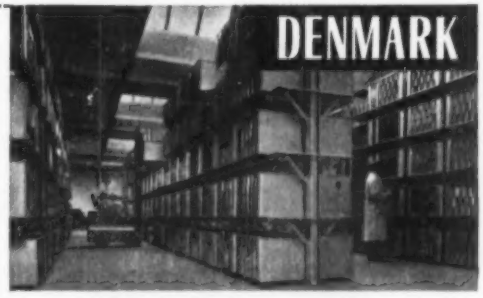
Industry, however, is ready for development of the plants necessary to produce electricity with atomic power. Both Westinghouse Electric Corp. and General Electric Co. have gone a long way in settling some of the problems involved through their work with submarine power plants.

Other companies, too, have some ideas of what an atomic-power plant will be like. The U.S. Atomic Energy Commission helped when it let four teams, each made up of two companies, make a survey of everything known about reactors. The object was to study prospects for a private reactor.—Business Wk, Mar 14, p94; Apr 11, p32

The World over... Multiply Your Storage Space by using CLARK MACHINES

The Findus organization had a problem: how to get the most and the best produce out of Sweden's limited growing season, and at the lowest possible price to the consumer. Up-to-the-minute equipment, including CLARK fork-lift trucks; purchased through A/B Bygg-och Transportekonomi, technical skill, and an aggressive research program; these were the cornerstones of Findus' success. Canned peas, for example, were cut, mechanically loaded into trucks, rushed to the viner station, threshed, washed, and pumped into the canner—in 3 hours! CLARK fork-lift trucks fit the Findus scheme of things: speed, economy and safety.

CLARK fork trucks play an important role in the production and distribution system of the UNILEVER (Lever Bros.) plant at Djakarta. This CARLOADER feeds raw materials to the production line. It is used primarily to load and unload boxcars and trucks, carry crates and drums from transportation to storage to production. Twice a day, the truck makes the rounds on the production line, placing pallets of material at each point. Import en Export Kantoor Koopman & Co., Djakarta, Clark representative for Indonesia, supplies UNILEVER and other progressive companies with tools for efficient handling.



S. Dyrup & Co., in cooperation with their CLARK distributor (A/S Lars Arnbak & Co., Copenhagen), engineered an ultra-modern handling system for their paint and lacquer factory. Built around a CLARK truck, this system combined small units into large ones for handling. Before, clerks had to climb ladders to reach the cans; storing and handling was difficult. Now, the working rhythm is steady, unbroken. Increased safety with less manual labor—faster production at less cost—these are by-products of the handling systems in which CLARK equipment plays a significant role.

• Write today for the name of your CLARK dealer—to Clark Equipment Company, Export Division, Battle Creek, Michigan, U.S.A.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

EXPORT DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 73, MICHIGAN, U.S.A.

Please send: ☐ Material Handling News ☐ Condensed Catalog

Name_____

Firm Name_____

Street_____

City_____ Country_____

What good are iceskates in the middle of a desert?

Purchasing-blunders less bizarre than this, *but much more serious*, happen every day! That's why the modern Purchasing Manager relies on a Remington Rand system of Purchasing Control — with *Kardex*. Visible, uniform Kardex is a single source for all the data you may need: balance on hand, specifications, cost, terms, contact, follow-up on order, and delivery. Kardex even tells you *when* and *how much* to order!

•

Give your business the benefit of Remington Rand's 76 years of experience in developing integrated office systems and equipment. Your local Remington Rand representative has an informative pamphlet "HOW TO FIND PURCHASING FACTS FASTER WITH KARDEX" — write for it on your business stationery *today!*

•

Sales and service in principal cities throughout the world.

Remington Rand INC

International Division, Room No. 9467
315 Fourth Avenue, New York 10, N. Y., U. S. A.

KARDEX LINEDEX VERTICAL VISIBLE FILING CABINETS SCHED-U-GRAPH

Economizer Recovers Heat From Exhaust

If your plant exhausts sizable quantities of warm air from process areas, you should consider waste heat recovery. One proved method uses the Briner economizer made by J. O. Ross Engineering Corp. Named after its inventor, this unit is an efficient heat exchanger for abstracting heat from air and vapor exhausted from industrial plants. Paper, textile and allied plants have especially benefited from the Briner unit.

Typical economizer setup for a paper mill starts with a hood over the paper machine to collect vapor laden hot air. Air is drawn up by an exhaust fan on roof, through a plate-type economizer. Outdoor air for machine and room ventilation passes over one side of the economizer's plates and is heated by the warm exhaust on the other side.

Operation resembles that of plate-type combustion-air preheaters for steam boilers. Water sprayed into the exhaust is heated as it falls through the warm air, and is collected in a sump. From there the water is pumped to the mill. Eliminators trap any water carryover before it reaches the fan.—Power, Mar, p84

Tests Steel Drawability

Simple test to determine drawing qualities of sheet steel can replace corner bend tests. The test is quick, non-destructive, and accurate; it can be made on the shop floor just before drawing.

The tester, called the Flex-Tester, is made by Steel City Testing Machines, Inc. Its principle is the same as that used by experienced press men when they bend a corner of a steel sheet to feel its resistance.

The instrument bends the sheet to a specified angle. Resistance of the sheet to bending causes a tongue portion of the tester to deflect. A dial gage records deflection in units, which when converted to arbitrary values to allow for variation in sheet thickness indicate drawability.—Iron Age, Mar 19, p143

Good Driver Cooperation Cuts Operating Costs

Millions of miles of road experience have proved to White Motor Co. that truck operating costs can be reduced by (1) improved driver relationship and cooperation, (2) proper preventive and repair maintenance, (3) modern tools and equipment, and (4) cooperation of and with the manufacturer.

Many truck users recognize and use the last three points, but neglect the first. While establishing driver responsibility has long been understood, certain intangible psychological factors have been treated too lightly to make them mean a cash saving. A few are:

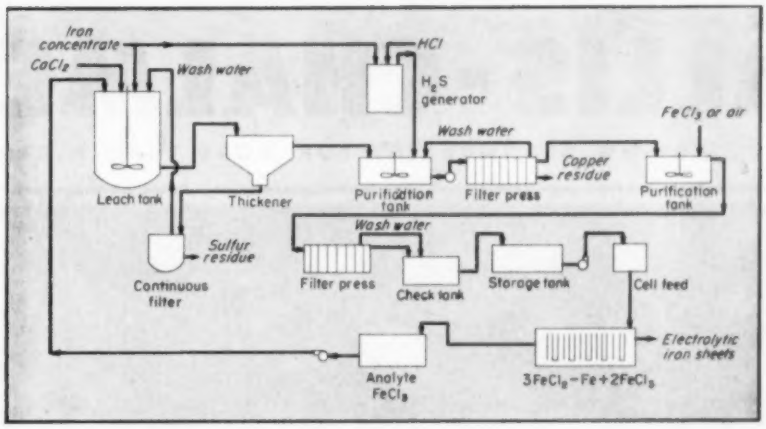
- **Encouraging** clean habits both inside the cab and personally.
- **Providing or requiring** suitable dress for uniformity throughout the operation. Remember that the driver is often the only direct company contact with the public.
- **Confining** driver assignments, wherever possible, to one and the same vehicle.
- **Meeting** with drivers periodically so drivers know management thinking.
- **Reducing** downtime by letting the driver talk about his truck and then having a plan to utilize the driver's intimate knowledge of his equipment and his insistence on its adequate maintenance.—Nat Pet News, Apr 8, p58

Chlorine Improves Poultry

Dr. M. Wayne Miller of the Washington Cooperative Farmers Association reported that chlorine dips improve life of chilled poultry.

Prior to cooling in ice water and cutting up, birds in Dr. Miller's experiments were dipped for 30 sec. in water containing 1,000 parts per million of free chlorine. Then they were stored at 33°F. for 2 weeks, and it was found that they had only about one-tenth the bacteria count of untreated birds. Further, their odor and appearance were satisfactory. Untreated poultry had soured.

After 18 days, dipped birds showed slight off-odors, while birds not dipped were decomposed. —Food Eng, Apr, p248



Pure-Iron Process

New electrolytic process produces a malleable iron so pure that it is in effect a new material. Raw material is waste low-grade ore

PURE DENSE IRON in the form of malleable sheets will soon be available in the U. S. from a process developed by Sulfide Ore Process Co. Plans for a commercial plant are well underway.

While a great deal of work has been done on electrolytic iron, the Sulfide Ore process is unique in one respect: it is based on the recovery of iron directly from a low-grade ore.

Raw material is pyrrhotite, a waste product of many mining and milling operations. An iron concentrate is produced by simple flotation from pyrrhotite tailings, such as available from a copper operation.

The concentrate is fed into a hot, agitated solution of ferrous and ferric chloride. Leaching brings iron into solution and reduces the ferric chloride to ferrous chloride. The mixture passes to a Dorr thickener that settles out the reaction product, which is sulfur, and any unreacted pyrrhotite.

Impurities are precipitated as metallic sulfides by treating with hydrogen sulfide gas and then filtered out in a Shriver filter press. Excess hydrogen sulfide gas is removed in a second purification tank either by aeration or by reaction with ferric chloride. The resulting suspension of fine sulfur is removed by a clarifying filteration in another Shriver press.

The remaining solution is then held in a check tank until it is verified as suitable for electrolysis. When the solution is fed to the cell, iron is deposited on the stainless-steel cathodes and ferric chloride forms at the graphite anodes. The anolyte is withdrawn continuously at a controlled rate and recycled to the leach tank.

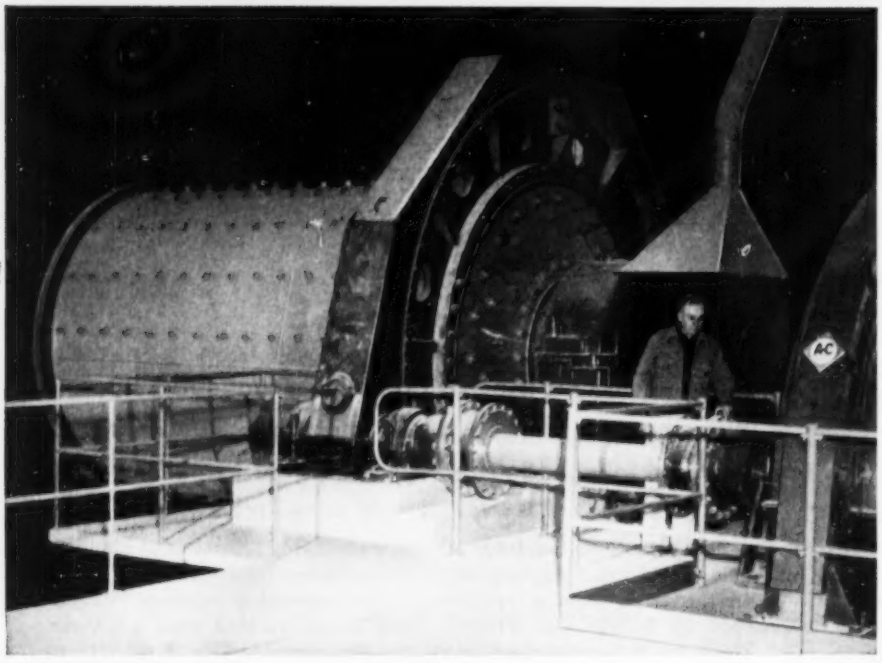
The nature of the iron deposit can be controlled by varying the cell temperature. At 20 to 30°C., a brittle deposit forms that can readily be ground to powder. At 90°C., a malleable sheet of the same density as rolled stock is formed.

Size of sheet depends on the cathode. Deposits have been made up to 3x4 ft. and from 0.002 to 0.25 in. thick. When desired thickness is obtained, the cathode is lifted from the cell, drained, and stripped with a suitable tool.

The iron produced runs to 99.99% pure. Potential uses are in special alloys because of purity, electro-magnetic applications because of high permeability, and for extreme cold-working operations. The iron also is highly suitable for glass and enamel coating; its high hot strength prevents warpage.—Chem Eng, Apr, p189

ALLIS-CHALMERS

SERVING ALL INDUSTRY FOR MORE THAN A CENTURY



COMPLETE Installations for Any Type of Grinding

SPECIFY Allis-Chalmers. You'll benefit from application experience that is unequaled. More than 1200 Allis-Chalmers grinding mills have been installed over the past 70 years. No other manufacturer brings you the breadth of application experience—experience that adds up to recommendation of the best, most economical unit for your needs.

A complete range of types and sizes is available. In addition, you benefit from a single source, single responsibility for all equipment. Grinding mills, motors, drives, and controls are all built in Allis-Chalmers shops.

For a copy of grinding mill bulletin 07B6718A, contact the Allis-Chalmers representative in your country or write:

ALLIS-CHALMERS MANUFACTURING COMPANY
General Machinery Division
Export Department, Milwaukee 1, Wisconsin, U. S. A.
Factories in U. S. A. and Canada

C-5695

ALLIS-CHALMERS DISTRIBUTORS THROUGHOUT THE WORLD

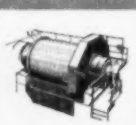
ALGERIA—Alger.
ARGENTINA—Buenos Aires.
AUSTRALIA—Sydney.
AUSTRIA—Vienna.
BELGIUM—Brussels.
BOLIVIA—La Paz.
BRAZIL—Rio de Janeiro, Sao Paulo, Recife (Pernambuco), Porto Alegre.
BRITISH BORNEO—Sandakan.
CANADA—Montreal.
CHILE—Santiago.
COLOMBIA—Barranquilla, Bogota, Medellin, Cali.
COSTA RICA—San José.
CUBA—Havana.
DENMARK—Copenhagen.
DOMINICAN REPUBLIC—Ciudad Trujillo.
EL SALVADOR—San Salvador.
ENGLAND—London.
FINLAND—Helsinki.
FRANCE—Paris.
FRENCH MOROCCO—Casablanca.
GREECE—Athens.
GUATEMALA—Guatemala.
HAITI—Port-au-Prince.
HAWAII—Honolulu, Hilo.
ICELAND—Reykjavik.
INDIA—Bombay.
IRAQ—Baghdad.
ISRAEL—Tel-Aviv.
ITALY—Milan.
MALAYA—Kuala Lumpur, Ipoh, Kota Bharu, Penang.
MEXICO—Guadalajara, Mexico City Monterrey, Tijuana.
NETHERLANDS—Amsterdam, The Hague.
NEW ZEALAND—Wellington.
NICARAGUA—Managua.
NORWAY—Oslo.
PANAMA—Panama.
PERU—Lima.
PORTUGAL—Lisbon.
PUERTO RICO—Ponce, San Juan.
REPUBLIC OF THE PHILIPPINES—Manila.
SARAWAK—Kuching.
SINGAPORE—Singapore.
SPAIN—Madrid.
SURINAM—Paramaribo, Nieuw-Nickerie
SWEDEN—Stockholm.
SWITZERLAND—Zurich.
THAILAND—Bangkok.
TUNISIA—Tunis.
TURKEY—Istanbul.
UNION OF SOUTH AFRICA—Johannesburg.
REPUBLIC OF INDONESIA—Djakarta, Surabaja.
URUGUAY—Montevideo.
VENEZUELA—Caracas.

Texrope is an Allis-Chalmers Trademark

★ ★ BASIC MACHINERY FOR THE WORLD'S MAJOR INDUSTRIES ★ ★

Electric Power Generation and Transmission

Steam and Hydraulic Turbines, Condensers



Equipment for Ore and Rock Processing

Centrifugal Pumps, Motors and Control

Complete Machinery for Cement Making

Texrope V-Belt Drives and Motors

NEW LIFT-UP overhead transport chain assembly makes it easy to clear damaged packages from Package Machinery Co's. high-speed wrapper—it is typical of new machines.

Food Packaging:

Keeping Up With the Times

Outstanding developments in equipment, special devices that curb production delays, better machine construction keynote packaging advances

FOOD INDUSTRY TREND today is toward the development of higher-speed packaging machines designed to operate with less delay.

Take the dairy field, for instance. Here automatic case packers for fresh milk have been developed, with successful commercial use in the offing. A milk-bottle uncaser is in operation, and both casers and uncasers are cutting costs in beverage plants.

Another innovation is an automatic bundler for 5- and 10-lb. bags of flour, sugar, and similar items. This unit loads six 10-lb. or twelve 5-lb. bags into a paper bag, which is then glued, folded, and sealed. This bag, cheaper than cartons, saves in shipping weight.

Speedy carton filling is now being achieved with a new, straight-line, multi-head net weigher. Employed is a principle of sensing minute movement of a "scale" beam toward an air jet. Back pressure builds up in the air line as the air gap narrows, and this operates an air relay to actuate the net-weight filler.

X-ray is now being used to check fill, especially liquids or free-flowing solids. Speed: 800-900 containers per min.

Simplicity of design is being accented more and more. A new aseptic can closer, for example, has only one-tenth the moving parts of earlier models. It weighs one-fourth as much and turns out 650 cans of the 202x404 size per min.

Other examples of applied simplicity are new beverage-bottle uncasers and casers with continuous travel, chain-mounted pick-up fingers that gently raise or lower bottles from or into moving cases.

As packaging costs go up, more people are turning to machines that perform many operations.

Typical of those now available are machines that: (1) fill and label bottles, (2) feed, form, fill, and seal pouches or small-sized cartons, (3) form a lined package from a cut-and-scored carton blank and an inner liner fed from a roll, (4) produce tea bags with strings and tags attached, (5) overwrap and count ½-lb. units of crackers, (6) group packages and insert them into cases or over-wrap them.

Of great importance in speeding production is the development of several special devices.

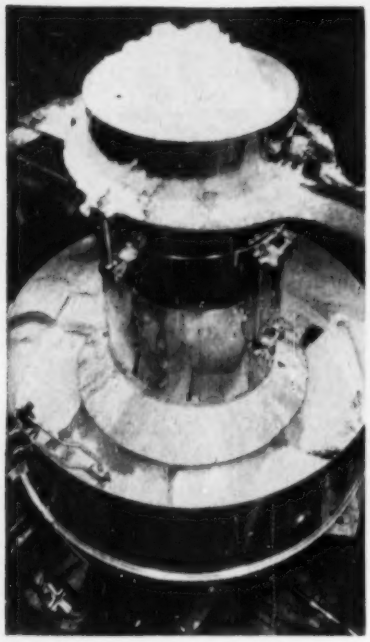
Heat controllers are now automatically adjusting the temperature of heat-sealing plates on wrapping machines to assure proper sealing of films.

Faster setting of heat-sealed waxed-paper overwraps for frozen-food cartons is now being achieved on shorter, water-cooled, compression lines.

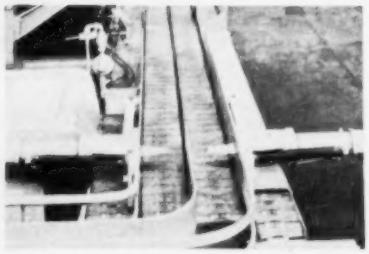
Applying solvent by wick has proved workable in sealing cellophane. It makes a strong, neat seal with less heat-sealing.

Application of a phototube-register-regulator on a wrapping machine has shown excellent re-

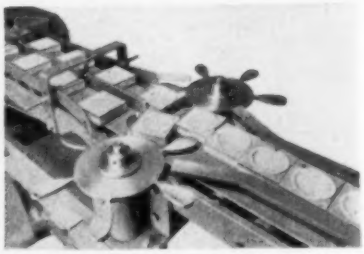
These Devices Will Help You Speed Up Packaging in Your Plant



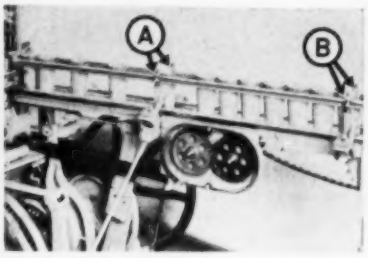
THIS cone-feed hopper keeps constant head of product in Pneumatic Scale Corp's. two-scale weigher. Rotating vanes sweep high-fat cake mixes into pipes above feed hoppers.



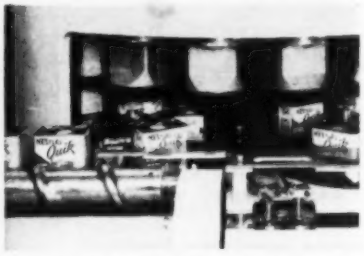
PNEUMATIC gates (foreground) are interconnected with safety clutch to stop conveyor automatically whenever bottles back up in Economic Machinery Co's. tandem labeler.



SPECIAL dividers split single line of cartons into two lanes. Similar units on Standard-Knapp Corp's. six-can cartoner feeds two beer cans at a time to six-can carry-home carton.



TIPPING over of jars is prevented by guide rails. Hand nuts (A and B) on rails permit height adjustments so caps ride above rails; bottoms of jars are on conveyors.



HELICAL intake (left) is being used increasingly to assure positive flow of containers. It operates on this Pneumatic Scale Corp. rotary vacuum filler without safety devices.

sults. The regulator scans the overwrap material as it is fed into the machine and tells the cutter bar exactly when to cut off a sheet.

Recently, a two-way compensator was developed for accurately cutting sheets from printed, roll-fed film. This device assures proper alignment of the printed sheet over the carton. To do this, an electric eye is hooked up with a mechanical timer.

Damage from jam ups, a constant threat to the efficiency of packaging lines, is now being minimized by safety devices that stop operation during a jam.

Overload safety clutches have been attached to drives to prevent damage to containers and machines. These clutches automatically kick-out and stop the machine whenever a predetermined load is reached.

On some labelers, a pneumatic gate has been connected with a safety clutch to stop the machine automatically when bottles tip over or back up. Damage to odd-shaped containers is also avoided by this arrangement.

In another instance, a specially designed floating star wheel automatically lifts up on its shaft to stop further entry of bottles onto the machine in case of a jam. Stoppage of this unit has no effect on the operation of the other equipment on the line. When the jam is cleared, the wheel falls into position and feed is then resumed.

Microswitches are now being used widely to stop packaging machines when a jam occurs. They are used also to actuate many other machine operations. In point is the case of improperly opened shipping cartons. Too much pressure in the caser is apt to break a machine part. A pressure-operated switch will avoid this.

On bundling machines, microswitches control the flow of cartons to the collator and assure a correct number of packages in the group. And microswitches also control the feed of cartons to wrapping machines.

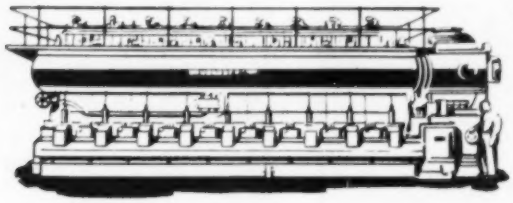
Along with these innovations and inventions that speed up packaging are a couple of other trends that will tend to make packaging better and cheaper. Machines themselves are being engineered better. They will have fewer parts generally, and they will be more easily accessible. Adjustments will be easier, requiring only simple tools and no micro-settings.

Plastics will play a growing part in packaging. Teflon is already being applied to certain machines to combat friction, prevent sticking of products like brown sugar, cake mixes, and instant coffee.

Teflon facings over label-wiping pads avoid glue pickup. Transparent Tygon and Saran tubing is now finding use as liquid-fillers hose. Nylon makes good bearings. Brand new metals too are going into heavy reciprocating parts. More and more are using light-weight aluminum and magnesium alloys.

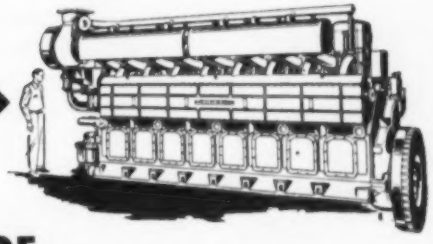
Case-hardened steels are going into parts that must resist distortion and wear. One firm is case-hardening gears and jaws on capping chucks. Other manufacturers are case-hardening such things as cams and for nozzle guides on bottling machines—Food Eng, Apr, p101

WHEN YOU THINK OF POWER



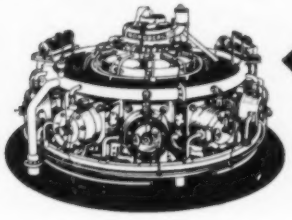
Nordberg 2-cycle Diesels for marine or stationary service are built in sizes from 1570 to 10,800 H.P. Two-cycle Duafuel engines are built in sizes from 1570 H.P. upward. They operate on gas fuel plus pilot oil, fuel oil only, or any combination of both—and are instantly changed over from one fuel to another, without changing speed or load.

Nordberg 4-cycle *SUPAIRTHERMAL* Engines are available for diesel, Duafuel or spark-fired gas operation, in sizes from 535 to 4270 H.P. Other 4-cycle models available from 220 H.P. upwards.



THINK OF

NORDBERG

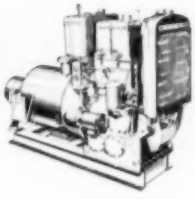


Nordberg 2-cycle Radial engines develop 1950 to 2125 H.P. or 1250 to 1500 K.W. at 400 R.P.M., as oil burning diesels, as spark-fired gas engines, and as Duafuel engines.

. . . DIESEL—DUAFUEL® AND SPARK-FIRED GAS ENGINES IN A WIDE RANGE OF SIZES FROM 10 TO OVER 10,000 H. P. IN A SINGLE ENGINE

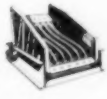
Write for further information, outlining your power requirements.

Nordberg "4FS" Diesel engines are built in 1, 2 and 3-cylinder sizes for generating electricity, pumping and straight power applications. These "packaged" power units develop from 10 to 45 H.P., or 6 to 30 K.W.



SYMONS® CONE and GYRATORY CRUSHERS

GRINDING MILLS



SYMONS VIBRATING GRIZZLIES and SCREENS

RAILWAY MAINTENANCE MACHINERY

MINE HOISTS

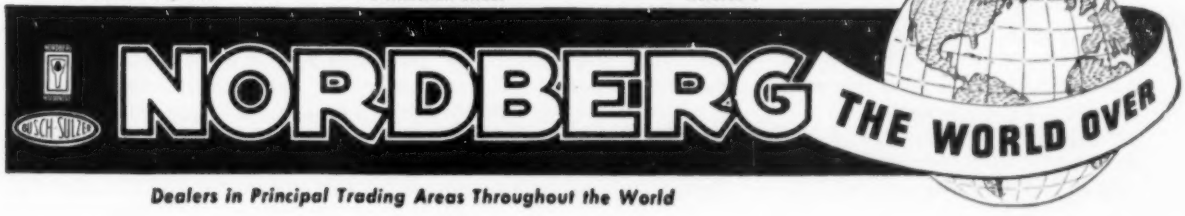
NORDBERG MFG. CO., Milwaukee, Wisconsin, U.S.A. CABLE ADDRESS: *NORDBERG*

LONDON
19 Curzon St., W.1.

JOHANNESBURG
42 Marshall Street

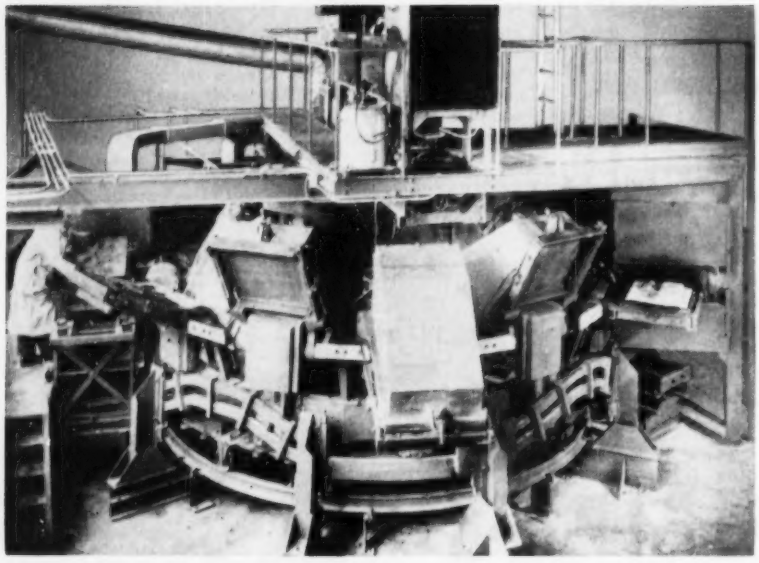
MEXICO, D.F.
Dolores 3

XP-153



Dealers in Principal Trading Areas Throughout the World

NEW PRODUCTS



This 12-Station Automatic Machine Turns Out 500 Shell Molds Per Day

A 12-station unit recently designed and built is said to make approximately 500 shell molds a day. The machine is automatic, requiring one man for operation. Pattern size on the standard machine is 28 × 22 in.

As the traveling table turns, a finished shell mold is removed from the pattern. Next, the pattern carriage moves up and engages the sand-resin hopper. Pattern and hopper, clamped tightly together, swing forward to below the horizontal, the material falls on the pattern, and the shell mold is formed.

Pattern and hopper rise, the hopper is disengaged, and the pattern carriage, with its soft shell mold, returns to the horizontal and enters the gas-fired oven. The mold is fully aired when it reaches the station at the far left in the illustration. Here the mold release pins lift automatically, the mold is removed, and the cycle starts again.

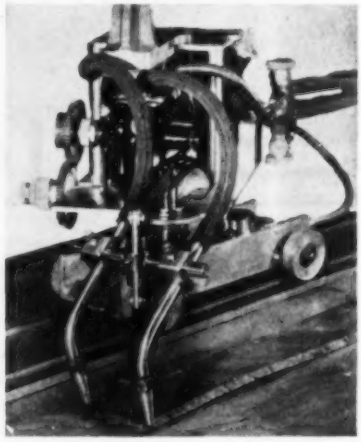
An automatic proportioner for sand, resin, and wetting agent is located on top of the machine.

Pattern plates may be changed quickly without stopping the machine, thereby providing production flexibility. The machine may be operated with all patterns producing the same molds, or with twelve different patterns working at the same time.—**Mechanical Handling Systems, Inc., 4601 Nancy Ave., Detroit 12, Mich.**—Auto Ind, Apr, p56

Comparison Bridge

Accurate and simple production tests are possible on the new general-purpose-type 1604-A comparison bridge. With a basic accuracy of 0.1%, the bridge can be used for direct comparison of resistors, capacitors, and inductors over a wide impedance range of about 2 ohms to 20 megohms. Two impedance-deviation ranges, ±5 and ±20 %, are provided. Dissipation-factor differences are also indicated.

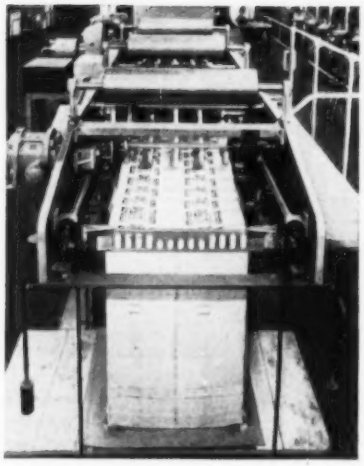
Bridge is completely self-contained with a cathode-ray visual detector and an oscillator operating at either 1 kc. or 5 kc. Operation is from the a-c. line. The point at which the bridge is grounded can be switched so that measurements can be made with the unknown either grounded or ungrounded.—**General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass.**—Electronics, Apr, p330



Double-Electrode Welding Doubles Welding Speed

Speed increases to 50% are claimed for new submerged-arc process called Twinarc. It employs two small electrode wires instead of a single large one. Higher currents made possible with two electrodes increase metal disposition rate and penetration. Typical speed: 15 in. per min. at 1,500 amp. on 34-in. fillet weld.

The process is recommended for butt or fillet welds in ¼-in. or thicker plate. Electrodes are normally in line, but may be skewed ¼ in. to make a wider bead or even placed side by side. A special electrode jaw, wire feed rolls, and wire guides adapt any standard Lincolnweld head for the new process.—**Lincoln Electric Co., Cleveland 17, Ohio**—Weld Eng, Apr, p74



High-Speed Sheeter

Capacity of new sheeter is from 8,500 to 11,000 sheets per hr. of glassine and paper-backed foil, 10,500 to 12,500 sheets per hr. of label paper, or 12,500 to 14,800 sheets per hr. of heavy paper or cardboard. Accuracy claimed is within 1/64 in. High speed is made possible by rapid drying of gravure inks; sheets from roll stock can be overlapped and delivered to the pile rapidly.—**Champlain Co., Inc., 88 Llewellyn Ave., Bloomfield, N. J.**—Paper Ind, Mar, p502

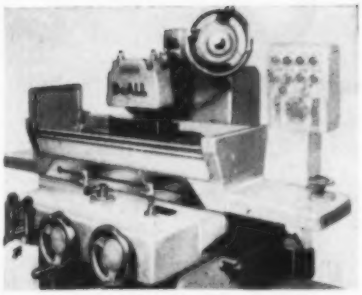
Constant Support Hanger

Model R hangers permit 10% increase or 10% decrease in their load by field adjustment of a single bolt, without impairing their constancy. Hangers are smaller, require less head room, can be bolted directly to the building structure. Frames are drilled for either single-rod or double-rod suspension. Three regular frame sizes provide maximum travel of 4, 8 and 12 in. and will take care of all loads over a wide range from 48 to 9,304 lb.

Ratios between spring force and supported load range from 1.15 to 1 minimum and 4 to 1 maximum. Each hanger is individually calibrated before shipment.—**Grinnel Co., Inc., 260 W. Exchange St., Providence 1, R. I.**—Power, Apr, p162

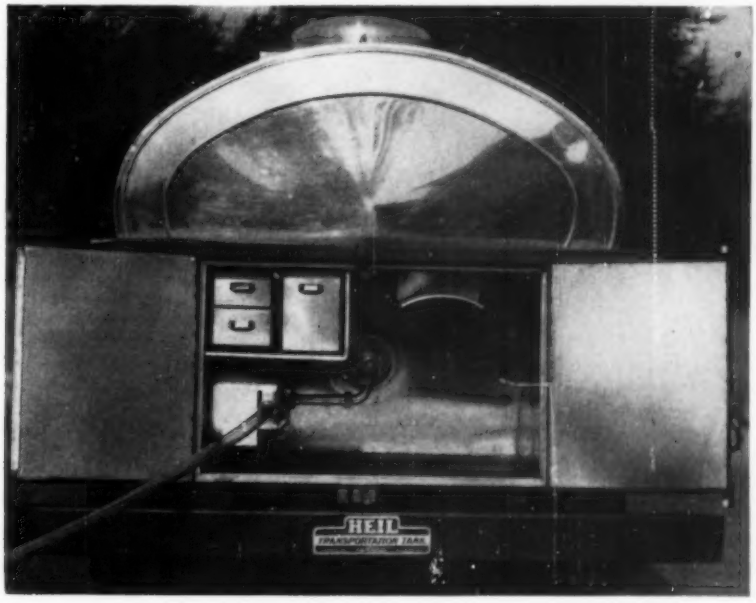
Electronic Level Indicator

Electronic instrument makes continuous level measurements, without mechanical or pneumatic means. Called "Telstor", the unit is useable with tanks, bins, hoppers, pressure vessels, or almost any type of container. Materials that can be measured include almost any type of liquid, regardless of viscosity, or granular solids.—**Fielden Instrument Div., Robertshaw-Fulton Controls Co., 110 E. Otterman St., Greensburg, Pa.**—Eng & Min J, Apr, p126



Toolroom Surface Grinder

Precision grinder has handwheel slip rings that allow the handwheel to be zeroed after an initial cut and measurement check so a direct reading of calibration is obtained. Another innovation is the coolant system, which provides selection of any one of three cooling methods. A variable cross-feed drive is for use in wheel dressing, broach sharpening, slotting, and other applications. Spindle-speed ranges are 400-4,000 up to 5,000-20,000 rpm—**DoALL Co., 254 N. Laurel Ave., Des Plaines, Ill.**—Iron Age, Mar. 5, p153



Tank Truck Has Milk Receiver

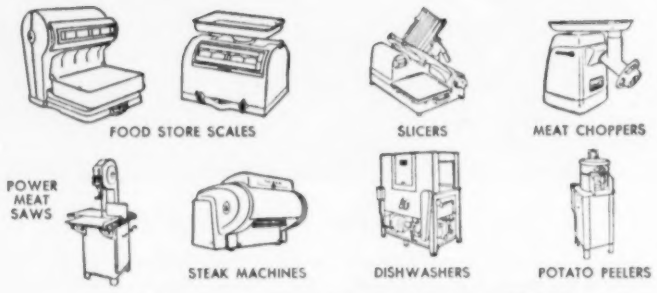
This new-type farm pickup tank truck is designed to cut hauling costs, reduce handling, and permit closer control of milk in transit. Back cabinet is air tight and locks securely with a refrigerator-type latch. Separate motor cabinet keeps dirt out of service cabinet. Two sample trays, 50-lb. ice chest, and hose carrier are stainless steel. Tubing is transparent plastic.—Heil Co., 3042 W. Montant St., Milwaukee 1, Wis.—Food Eng, Apr, p159

TOLEDO® SCALES for INDUSTRY

Since 1901

Control costs at every step ... receiving, processing, stock and shipping ... with modern Toledo Scales!

Be sure you have the right scales at the right places. They save time for you. On your scales, material in effect becomes money. The complete Toledo line includes portables, floor scales, bench scales, track scales, counting scales—and many more— exactly what you need to control costs today. You can stop human errors in weighing, too—with Toledo Printweigh —the scale that prints weights automatically. Write for catalog M-10. Toledo Scale Co., Toledo 1, Ohio, U. S. A.

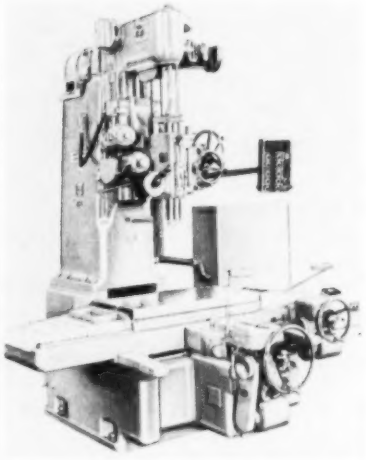


... Leader in modern FOOD STORE and RESTAURANT KITCHEN MACHINES

New Vat Yellow Shows Versatile Applications

New anthraquinone-type vat color close in shade to the standard Spanish yellow, Ponsol Yellow PG is suitable for both cotton and rayon in the form of yarn or piece goods. Its good fastness to washing makes it ideal for work clothing, towelings, sheetings, and similar items.

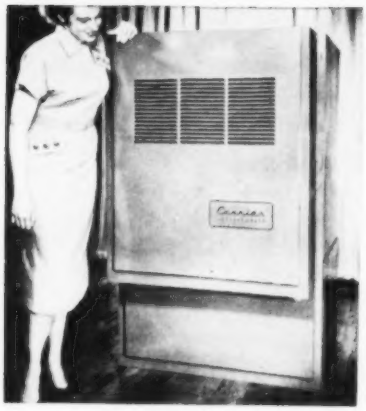
Ponsol Yellow PG double paste will also find use as a shading component in mixtures where added brightness is desired and as a base for rich brown and orange shades. The color has excellent stability when reduced at 120°F.—**E. I. du Pont de Nemours & Co. Inc., Export Div., Wilmington, Del.**—Textile World, Apr, p132



Electrolimit Jig Borer Permits Fine Settings

Model 2E jig borer, with 22 x 44-in. table, has been added to the series of jig borers. Two separate Electrolimit measuring units are for longitudinal and transverse movements. Estimated settings smaller than 0.0001 in. can be made.

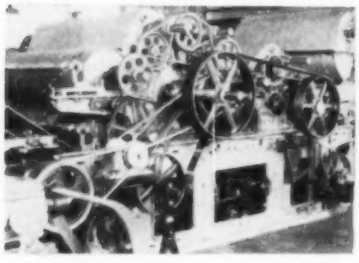
Quill rolls on 288 balls preloaded between the quill and liner with a bearing pressure of 6,000 lb. Stability of quill makes milling feeds practical for table and carriage. Milling feeds are infinitely variable from 1 to 15 in. per min. Spindle feeds vary from 0.0005 to 0.015 in. per rev. and spindle speeds from 37 to 1,800 rpm.—**Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.**—Am Mach, Mar 30, p145



Versatile Weathermaker

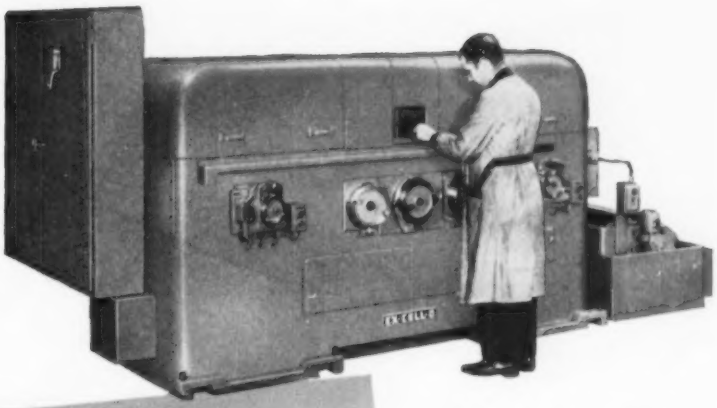
Unit requires minimum installation space as it measures only 37×37 in. square and 62 in. high. It provides 2 tons of cooling and dehumidifying, plus winter heating and year-round filtered air circulation. Burners are available for heating with gas or oil.

Conditioned air can be sent by duct from top of unit in any combination of 4 directions or straight up; return air can be brought back to rear, bottom, or side of unit. The entire unit is enclosed in one-piece cabinet designed to pass through doors less than 29 in. wide. Components can be removed or serviced from front of unit. As operation is noiseless, the unit can be put near living areas.—**Carrier Corp, So. Geddes, Syracuse 1, N. Y.**—Elec Merch, Apr, p159



New High-Speed Garnett

Simplified garnett for high-speed processing of cotton, jute, and synthetic fibers is designed to give increased production and reduced operating and maintenance costs. High production is obtained from a larger-diameter worker, a stripper, and an additional high-speed fancy on finishing cylinder —all revolving opposite to the main cylinder.—James Hunter Machine Co., North Adams, Mass.—Textile World, Mar, p145

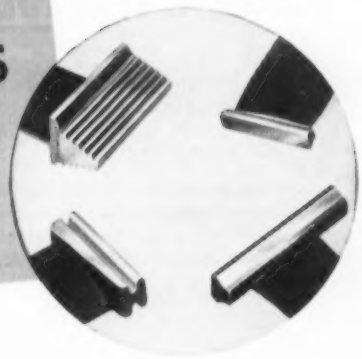


Style 85 Precision Two-Wheel Form Grinder for grinding roots of jet blades.

Production-Proved

EX-CELL-O

MACHINE GRINDS JET BLADE ROOTS



XLO

Dovetail and pinetree forms, in various sizes, are ground from rough forgings.

PRECISION TWO-WHEEL FORM GRINDER GIVES FINE FINISH, HIGH PRODUCTION

This Ex-Cell-O Precision Two-Wheel Form Grinder finishes simultaneously both sides of the roots of jet engine blades. It is fully automatic except for loading and unloading.

Two 24-inch diamond-dressed grinding wheels are used, the work reciprocating between them. Dovetail or pinetree forms of various sizes can be ground economically from semi-finished or rough forgings. Work reciprocation, wheel feed to finish size, coolant control, unclamping, wheel retraction, and wheel dressing are all done in an automatic cycle.

For more information and complete specifications on this production machine contact Ex-Cell-O, Detroit, U.S.A.

53-11

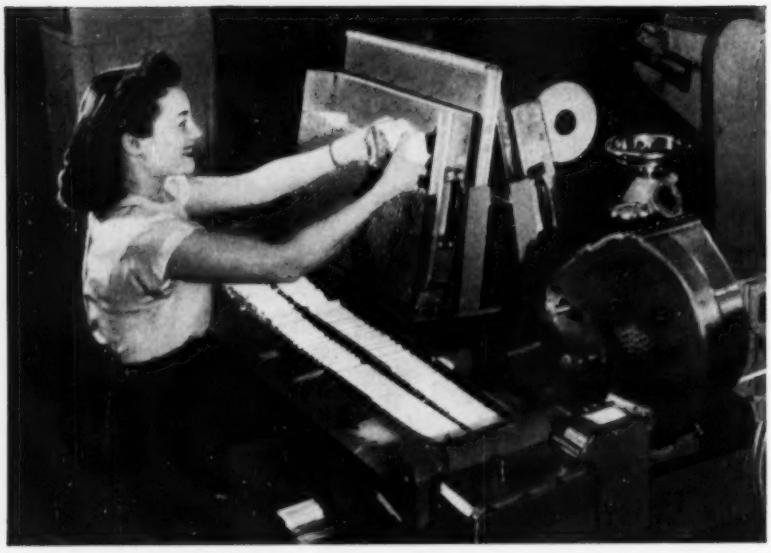
EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN, U.S.A.

CABLE ADDRESS: XLO, DETROIT, U.S.A.

PRECISION MACHINE TOOLS • CUTTING TOOLS • MACHINES TO PACKAGE MILK IN SANITARY PAPER CONTAINERS

Production Ideas...



from the *Tobacco Industry*

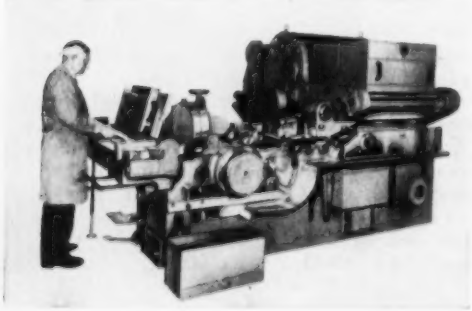
The upward climb in cigarette sales can be traced directly to the technique of mass production.

As in many other industries, this calls for high-speed, automatic machines – the kind supplied to the cigarette industry by American Machine & Foundry Company.

AMF machines for processing leaf tobacco and making and packing cigarettes have been developed by constant engineering research in a successful effort to produce better cigarettes at a lower unit cost.

At the consumer level this means growing cigarette sales – an improved product at a price more people can afford to pay.

For example, there's a striking parallel in the growth of the cigarette industry and the development and sale of the AMF Standard® Cigarette Maker. In other industries, too, AMF cost-saving machines are making possible increased sales by means of better production methods.



The AMF Standard Cigarette Maker

produces perfectly-formed cigarettes at the rate of 1,250 per minute. This machine is the type used in many of the world's leading cigarette manufacturing plants. Free literature sent on request.

AMF does it better ... automatically!

AMERICAN MACHINE & FOUNDRY COMPANY

479 Fifth Avenue, New York 17, New York, U.S.A.

AMF products for Home and Industry: AUTOMATIC PINSPOTTERS, BOWLING EQUIPMENT AND SUPPLIES · LOWERATOR® DISPENSERS · WAHLSTROM® FULLY-AUTOMATIC CHUCKS · FLOAT-LOCK SAFETY VISES · ROADMASTER® BICYCLES · JUNIOR® VEHICLES · DE WALT® POWERSAWS · MONARCH® WOODWORKING MACHINES · CLEVE-WELD® TIRE RIMS · SLIP STITCHING AND ORNAMENTAL STITCHING MACHINES · CELLULOSE BANDING MACHINES · LELAND® ELECTRIC MOTORS, GENERATORS, INVERTERS · STERLING RELAYS · EVERLOCK® WASHERS · AMALOY® LEAD-TIN ALLOYS · TOBACCO PROCESSING EQUIPMENT, CIGARETTE AND CIGAR MACHINERY · AMF® CONTINUOUS MIXERS AND GLEN® BATCH MIXERS · UNION MAKE-UP EQUIPMENT AND AMF® BAKERY MACHINERY, COOLERS & OVENS. Creators and producers of electronic and mechanical equipment for the armed services.

NEW PRODUCT BRIEFS

Quick-acting Door—New door for pressure vessels can be opened and closed quickly by simply expanding or contracting a split ring. Usual pressure-vessel door takes 20 to 30 min. for operation, compared to 30 sec. for new door.—**Blaw-Knox Co., 342 Madison Ave., New York 17, N. Y.**—Chem Wk, Apr 11, p62

Measures Flow—Potter-Brown flowmeter accurately measures flow of liquid or gas, whether toxic, corrosive, or viscous. Sensing elements vary in size from ⅞ in. to 6 in. in dia. Largest element allows flow control up to 4,000 gal. per min.—**Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.**—Ceramic Ind, Apr, p23

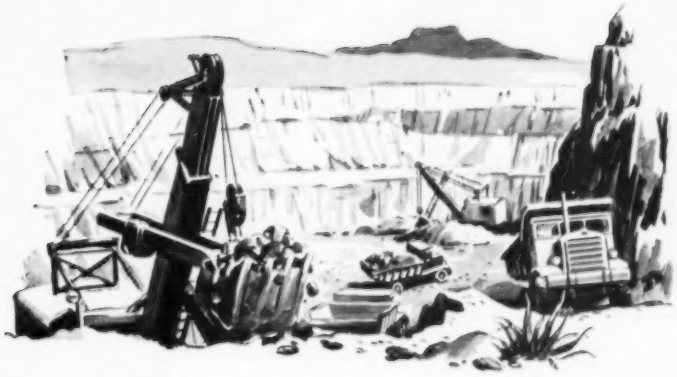
Ultrasonic Degreaser—New degreasing machine has ceramic transducers, which convert electrical energy of 40 v. into sound energy and projects it through the solvent at 430,000 cycles per sec. The ultrasonic energy cleans work almost instantly. Low operating voltage permits immersion of transducers in solvent.—**Detrex Corp., Box 501, Detroit 32, Mich.**—Am Mach, Mar 30, p144

Speeds Payroll Work—General-purpose electronic digital computer figures all types of payroll, labor, material and billing calculations. It also figures average unit prices, inventory turnover ratios, efficiency ratings, and operating ratios and percentages. Two cabinets house card-reading and punching unit and electronic computer unit.—**IBM World Trade Corp., 590 Madison Ave., New York, N. Y.**—American Business, Mar, p58

Telescoping-sleeve Pump—New pump, only 7¼-in. long, delivers 2.4 to 7.2 gal. per min. at heads of 20 to 1,000 ft. Nine sleeves extending into two cylinder blocks telescope and give pumping effect when blocks are rotated. No connecting rods, gears, springs, or cams are needed in the pump.—**Eastman Pacific Co., 2320 E. 8th St., Los Angeles 21, Calif.**—Prod Eng, Apr, p238

CUMMINS® DIESELS

make light work of tough jobs



Cummins Diesels are designed to take the hardest punishment without complaint. In shovels and trucks at the mines and the oil fields—for any rugged power application—it pays to specify Cummins Diesels.

Advanced engineering features and an exclusive fuel system are two of the reasons why Cummins Diesels are adaptable to all the tough jobs. See for yourself how a Cummins lightweight, high-speed, powerful (60 to 600 h.p.) diesel will fit into your operations.

Our world-wide parts and service organization is ready to serve you. Inquire today!

CUMMINS

151A(E)

CUMMINS DIESEL EXPORT CORPORATION

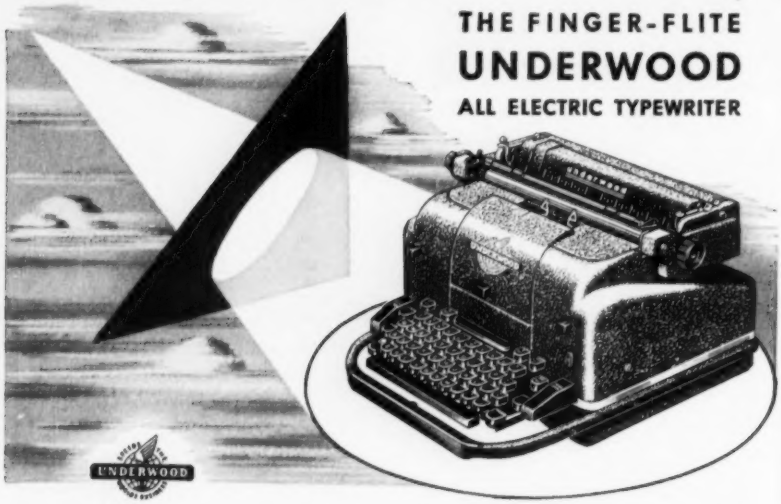
Columbus, Indiana, U.S.A.—Cable: CUMDIEX

New York City Office: 1459 Chrysler Building, East, New York 17, N.Y. • Telephone Murray Hill 9-4334

4-53-53 MG MM(E)

Designed for tomorrow . . . available today!

THE FINGER-FLITE
UNDERWOOD
ALL ELECTRIC TYPEWRITER



Modern as tomorrow . . . the new UNDERWOOD All Electric Typewriter gives you many exclusive new features . . . electric margins . . . quiet operation . . . durable construction . . . feather-light touch that reduces fatigue and increases typing production.

Sales and Service Throughout the World • Consult your local Underwood Dealer or write to us
UNDERWOOD CORPORATION *International Division*
1 PARK AVENUE, NEW YORK 16, N. Y., U. S. A.
Typewriters • Adding Machines • Accounting Machines • Carbon Paper • Ribbons

VICTOR MOLYFLEX

hack saw blades

Now high speed steel blades can be used for *all* metal cutting jobs. Victor "Molyflex" Blades are shatterproof, so flexible they cannot be broken in use in a frame. Yet they cut just as well, last just as long as high speed steel blades.

VICTOR SAW WORKS, INC.
MIDDLETOWN, N. Y., U. S. A.
MAKERS OF HAND AND POWER HACK SAW BLADES, FRAMES AND BAND SAW BLADES

Australia; Walter A. Caz Pty. Ltd., Shorter House, 193-195 Clarence St., Sydney, N.S.W. • Argentina; Will L. Smith, S.A., 443 Luis Saenz Pena 451, Buenos Aires. • Belgium; Maison Mouillet, Rue St. Jean, 12, Liege. • Brazil; Alfredo Kramer & Cia. Ltda., Caixa Postal 557, Rio de Janeiro; Alfredo Kramer & Cia. Ltda., Caixa Postal 2984, Sao Paulo. • Chile; Leopoldo Hachhausler, Casilla 458, Santiago de Chile. • China; Kane Import Corp., 10 E. 40th St., New York 16, N. Y. • Colombia; Hans Schultz, Apartado Aereo 802, Barranquilla. • Costa Rica; Arthur W. Gough, Apartado No. 133, San Jose. • Cuba; Cuban Air Products Corp., San Juan de Dios (Progreso) 2F154, Havana. • Denmark; Chr. Schmidt & Co., Amaliegade 24, Copenhagen. • Dominican Republic; Hector Lluberes, Arzobispo Nouel 74, Ciudad Trujillo. • Ecuador; Cesar Barahona L., Casilla 175, Quito. • Egypt, Samuel R. Weiche, 50 Rue Midan, Alexandria. • Finland, O/Y Trade A/B, Tolagatan 29B, Helsingfors. • France; Societe S.E.R.E.B., 148 Rue de Neisy-le-sec, Bagnolet (Seine). • Haiti, W. I.; Andre Cameau, 241 Ave. Pdt. Trujillo 241, Port-au-Prince. • Holland, A. Helders & Zonen, Hoogstraat 329, Rotterdam. • India; Associated Imports & Exports Co., Ltd., P-6 Mission Row Extension, Calcutta; Associated Imports & Exports Co., Ltd., 35-36 People's Building, Sir Pherozshah Mehta Road, Fort, Bombay. • Ireland; Hendron Bros. (Dublin) Ltd., 37/39 Up. Dominck St., Broadstone, Dublin. • Italy; Defries & Co., Viale Monza 14, Milano. • Jamaica, B. W. I.; Abrahan, Henriques & Jay, 25-27 Duke Street, Kingston. • Mexico, D. F.; Agencias Canadienses y Occidentales, S.A., Apartado 8608. • Norway; A. B. Laurantzon, Post Boks 392, Oslo. • Transjordania; Iran; Iraq; Palestine; S. Rahmani, Rahmani's Bldg., Haifa. • Panama, R. de P.; Demetrio Fernandez G., Apartado 574. • Peru; A. y F. Wiese, Edificio Wiese, Lima. • Philippines; Reliance Commercial Enterprises, Inc., 123 Juan Luna, Rm. 402—4th Floor, Manila. • Sweden; Slipmaterialaffaren, Malmo. • Switzerland; Armand Cuhat & Co., 65 Todistrasse, Zurich. • Syria & Lebanon; Societe Commerciale des Machines et Material Industrial, 94 Avenue Baron, Aleppo. • Turkey; Leon Bernardin Marco, Posta Kutusu 85, Istanbul. • Uruguay; Will L. Smith, S.A.U., 1181 Uruguay 1183, Montevideo. • Venezuela; M. M. Minino Bashr, Apartado 1295, Caracas. • New York; Will L. Smith, S.A., 80 Broadway, New York. • Portugal; Pierre Dumaz, Alexandre Braga, Porto. • Honduras; 81 Auto Schales & Lozano, Tegucigalpa, D.C. • S. Africa, Belgian Congo, Spain, Porto Rico, Hawaii, Russia; Frazar & Co., 30 Church St., New York 7, New York.

1420

New Exploration Tool Will Help Geologists

What may be the most significant development in exploratory geology in recent years was revealed early in March by Carter Oil Co. of Tulsa. The company disclosed that it is now using fossil pollen and spores to determine age of rocks and to locate shore lines of ancient seas.

Seven years of study and collection of the infinitesimal microfossils taken from oil-well cores and cuttings have enabled Carter to build up an extensive reference library of 14,000 microfossils. Its technologists can identify rock formations cut anywhere in the world.

Fossil spores and pollen are found in about 45% of all well cuttings compared to less than 1% for foraminifero and larger fossils. So many rocks whose ages cannot be determined by other means can now be positively identified. Shales, which often contain no foraminifera, can be identified according to age.

Locating shore lines of ancient seas is valuable as a great deal of oil is believed to be associated with their beaches. Cuttings from as few as three wells indicate such shore lines as spore and pollen fossils are most numerous near the old shore line, decreasing in number seaward.

The new method of determining a rock's age is expected to supplement present geological methods. —Oil & Gas J, Mar 9, p64

Have You Read . . .

. . . the article on Mexican development on page 15? The anti-graft campaign mentioned in the article has reached even the children. The New York Times reports that 15-year-old Anastasio Currusqueta Martinez was chosen to be mayor of Mexico City for 5 min. as part of Children's Day celebration. At the end of his term of office, Anastasio complied with the anti-corruption law. He pulled a peso from his pocket and announced, "This was my fortune when I came and this is my fortune on leaving office."

Pressure Processing

. . . whoever uses it in their production is a customer or potential customer of **H-P-M**

Rapid-Fire . . . Accurate . . . Dependable SHELL FORGING calls for H-P-Ms!

Piercing, bottoming, drawing, nosing and living up to strict governmental production requirements are all in a day's work for H-P-M shell forging installations like this one at J. B. Beaird Company, Inc., Shreveport, Louisiana.

If your planning calls for forgings . . . H-P-M's proven ability to reduce scrap loss, save material and cut machining time are three good reasons why you should talk shop with an H-P-M engineer. His experience and assistance will be of real value to you at the planning stage. Write today!

HPM

THE HYDRAULIC PRESS MFG. CO.

1086 Marion Road, Mount Gilead, Ohio, U. S. A.

Presses for Every Pressure Processing Application

DOWICIDE PRESERVATIVES

improve product quality for nine important industries

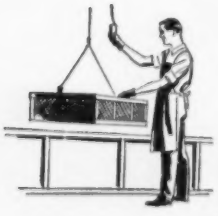
Destructive mold and bacteria attack on raw materials and finished products controlled by DOWICIDES

Industry the world over is increasing manufacturing efficiency and improving product quality with DOWICIDE PRESERVATIVES. Positive control against spoilage caused by micro-organisms increases profits and makes finished products last longer—sell better.

Dow manufactures fourteen different DOWICIDE PRESERVATIVES. Alone or in combinations they protect sizing and coating materials in the *textile* industry. In *paper and pulp* they give effective slime control and make finished products mold-resistant. In the *paint* industry they prolong the shelf-life of latex types and prevent mold growth on surfaces of oil-base paints.

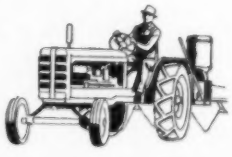
DOWICIDE PRESERVATIVES are widely used in many other industries . . . lumber, leather, petroleum, agricultural, germicides and adhesives. Wherever mold or bacteria growth results in a processing or selling problem, look to DOWICIDE PRESERVATIVES for a sure economical solution. For more information write to Dow, Dept. EX 3-80.

look to DOW for high quality chemicals



SOLVENTS—Dow manufactures a wide range of solvents. Because Dow's chlorinated solvents dissolve greases, fats and waxes quickly, they are extensively used as cleaners in the metal working industry. Other Dow solvents include Dowanol glycol ethers, polyglycols and alkanolamines.

AGRICULTURAL CHEMICALS—To help farmers raise more and better crops and livestock, Dow manufactures weed killers, insecticides, fungicides, soil and grain fumigants, plant growth regulators and veterinary chemicals. Extensive research by Dow furthers agricultural progress all over the world.

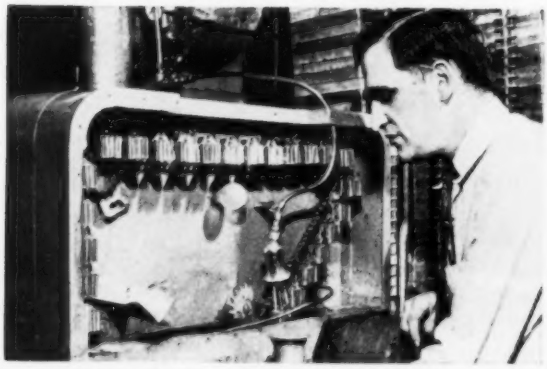


DOW produces more than 600 chemicals including industrial and agricultural chemicals . . . fine chemicals for the pharmaceutical industry . . . chemicals basic to progress and industry.

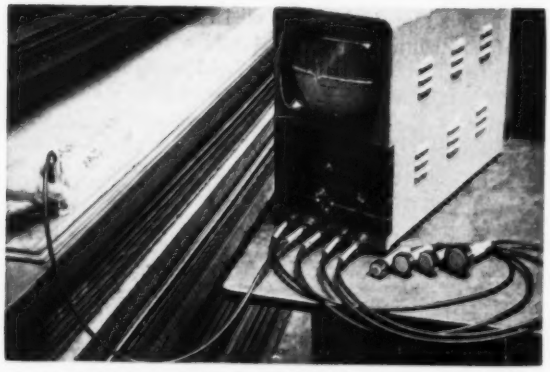
DOW CHEMICAL INTERNATIONAL LIMITED
Midland, Michigan, U. S. A.; 21 Dreikoenigstrasse, Zurich 2, Switzerland, Cable: Dowintal

DOW CHEMICAL INTER-AMERICAN LIMITED
Midland, Michigan, U. S. A.; Edificio Artigas, Montevideo, Uruguay, Cable: Dowpanam

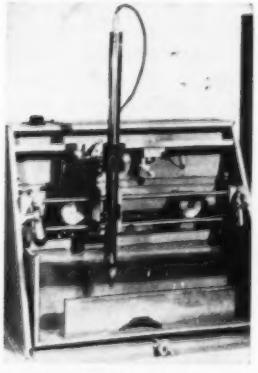
Sonic Energy—A New Tool



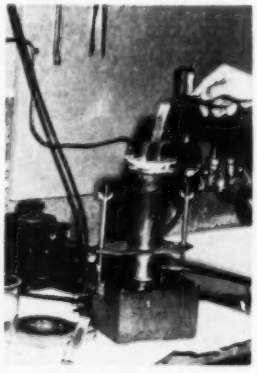
CLEANING SMALL PARTS on a regular production basis with ultrasonics proved practical for Schick, Inc.



MEASURING THICKNESS of sheet steel is simplified with sonic energy. Five probes cover thickness range.



IMMERSION checks dimensions of odd shapes.



TINNING aluminum is easy for sonics.

. . . Has Proved Itself in These Applications

Cutting Carbide Dies
Inspecting pipes for internal corrosion
Cleaning and degreasing metal parts
Removing oxide scale from metals
Inspecting metals for internal defects
Gaging thickness of sheet steel in stacks
Measuring liquid in sealed containers
Tinning aluminum
Precipitating smoke and fumes
Dispersing and wetting paint pigments
Emulsifying immiscible liquids
Measuring elastic properties of metals
Homogenizing milk
Measuring viscosity of liquids instantaneously
Measuring length of bar stock while in racks
Inspecting bonding of laminations

What Is Sonic Energy?

Energy transmitted by waves that take the same form as sound waves—alternate, regularly spaced compressions, and rarefactions—is called sonic energy. But useful sonic energy does not always create any sound that can be heard.

Ultrasonic energy describes sonic energy at frequencies above the audible range—from about 20,000 cps. up. The limit has not yet been reached.

Here are some new terms to learn before you become familiar with the sonic-energy field.

• Transducer—In sonic energy, a transducer is a device that converts electrical or mechnical energy into sonic energy and (sometimes) vice versa.

• Elastic Medium—Any material, when compressed by physical impact, that tends not only to return to its original state, but also to "stretch" beyond this state by a rarefaction of its internal structure is an elastic medium.

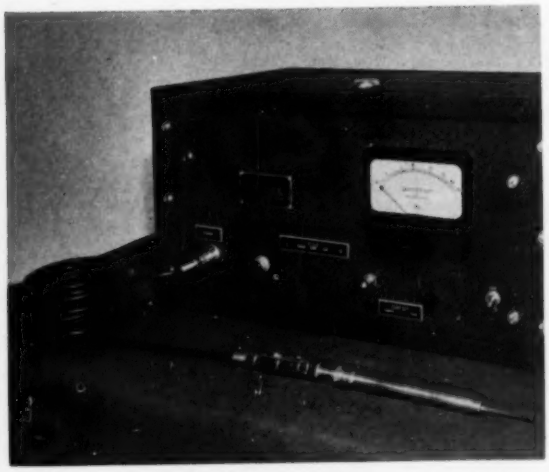
• Coupling Medium—Any material that carries sonic energy from transducer to the point at which at performs work is called a coupling medium.

• Magnetostrictive Transducer—Certain metals, when subjected to magnetic fields, will shrink and then enlarge with each change of the field. The changes in the physical length of the transducer set up sonic vibrations in the elastic medium.

• Piezoelectric Transducer—Certain crystals can be made to move physically by subjecting them to

You Can Measure Almost Anything That Transmits Sonic Energy

POINT-TO-POINT METHOD of inspection "transmits" signal from one probe, "receives" it at the other.



VISCOSITY OF LIQUIDS can be measured instantaneously. Instrument can provide automatic process control.

rapidly reversing electrical potential. The crystal then vibrates much like a piston. These vibrations set up waves of sonic energy in whatever elastic medium is in contact with the surface.

How Sonic Energy Measures, Inspects, Supplies Useful Power

Everyone is familiar with echoes of the human voice. They are simply sound waves bouncing back from an obstruction. The longer the time for the echo to return, the greater the distance to the obstruction.

The same principle is now being applied to measure almost anything that will transmit sonic energy. In industry, measurements in metal where it is convenient to get at only one side or one end of an object are the most common applications.

Two different systems put sonic energy to work making measurements or internal inspections: the echo system and the resonance system.

Echo System—In essence, a brief signal is transmitted and elapsed time out and back checked. To find out how far the sound signal traveled, the time is multiplied by the speed of sound in the particular material being measured.

Accuracy in measuring distances of an inch or more is better than ±5%. But with less than ½-in. distances, precision drops off. The echo system also has an upper limit—about 25-30 ft. in steel.

Resonance System—The basis of this system is the fact that a given material will have a certain natural resonant frequency that is proportional to its thickness. In operation, the frequency of the input signal is varied until it exactly matches the resonant frequency of the material.

Within the range of 0.0125 to 0.4 in. (in steel), precision is ±1-2% from resonance systems. By using harmonics, the range can be extended up to 3 or 4 in., but with progressively less precision. At this limit, the echo system can take over.

"Relative" Measurements—Sonic energy can find cracks, flaws, or deposits of foreign substances hidden in a material. They will reflect some, if not all, of the sound waves that strike it. By moving the transducers around, a plot of the size and location of the internal discontinuity can be made.

Choice of Equipment—Almost without exception, piezoelectric transducers are used for metal measuring—whether by echo or resonance. To "cover" a continuous range of distances from less than 1 in. to several feet (in steel), a set of transducers—crystals of progressively larger sizes—is needed.

A high-frequency electronic generator capable of driving the crystals at any frequency from about 250,000 to 10-million cps. is also needed.

Power Applications—Here the sonic energy level is higher—high enough to bring about a permanent physical or chemical change in the part or material subjected to the impact of sonic energy. In most cases, the actual work is done by either agitation or cavitation caused by the sonic energy waves.

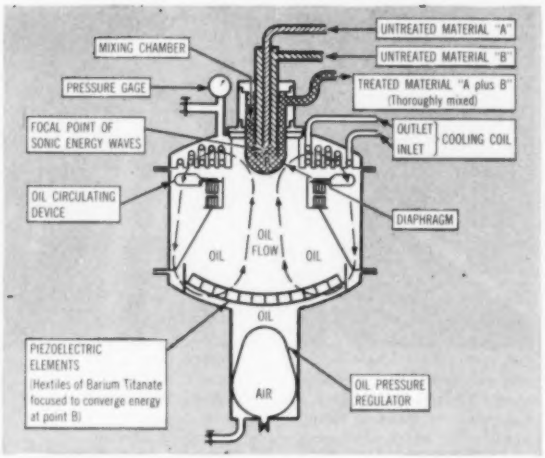
Agitation—Sonic energy causes a violent agitation of the individual molecules in an elastic medium. Molecular agitation will often mix two liquids—even when they are normally immiscible. But sometimes cavitation is needed to get results.

An "indirect" result of molecular agitation is a scrubbing, almost abrasive action. This permits removal of dirt, grease, and "loose" coatings from the surface of parts or materials immersed in the agitated medium. For truly abrasive cutting action, tiny particles of abrasive is added to the medium.

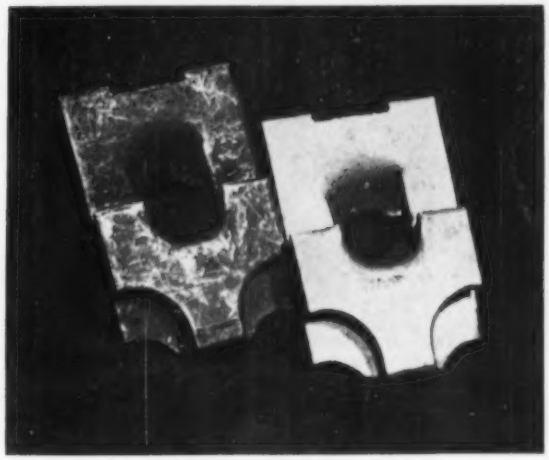
Cavitation—This is the process of creating tiny vacuum pockets in a liquid medium. It is caused by violent agitation of the liquid.

These two ways put cavitation to work: (1) direct impact on the surface of the submerged part or material and (2) acceleration of abrasive particles.

Super-Cleaning, Mixing the Immiscible Need Sonic-Energy Power



CONTINUOUS EMULSIFICATION on a production scale is possible with system of focused sonic waves.



OXIDE COATING of these parts was removed from one on the right in seconds in a 27,000-cps. bath.

At 8,000 to 30,000 cps., cavitation in an abrasive-filled liquid makes it possible to cut tungsten carbide easily. At 20 cps. or less, cavitational effects make it possible to ram an oil well through solid granite.

How To Measure, Inspect, and Do Physical Work with Sonic Energy

Measuring—Distance from one "wall" to the other of any homogeneous sound-conducting material can be determined to a high degree of precision. Or the heights of liquids in containers can be checked.

The physical constants, viscosity and modulus of elasticity, can be accurately measured with sonic energy. Viscosity affects the rate of propagation and attenuation of sonic energy. Readings can be taken continuously.

The modulus of elasticity also affects rate of propagation and attenuation. With ultrasonic equipment, it is possible to measure the modulus instantaneously—while parts are undergoing test or while they are in place in the field.

Inspection and Flaw Detection—Moving a probe over the surface of a solid object permits location of internal cracks, flaws, and deposits of foreign material. They can be "seen" on an oscilloscope screen attached to the probe. Distance between indications on the screen tells approximate distance to the discontinuity. It is particularly useful for internal inspections of forgings.

To inspect hollow objects, a pipe for example, the probe does not have to move all the way around the circumference of the pipe. By mounting a crystal on a wedge, the sonic waves can be angled into the metal to make them bounce back and forth between the inner and outer surfaces and come back to the probe. Cracks or flaws will show up as irregularities on the oscilloscope screen.

A weld will produce an internal discontinuity. But a good weld will provide only a minor reflection, and it will be a uniform reflection along its entire length. A non-uniform reflection indicates cracks, air holes, or foreign matter in the weld.

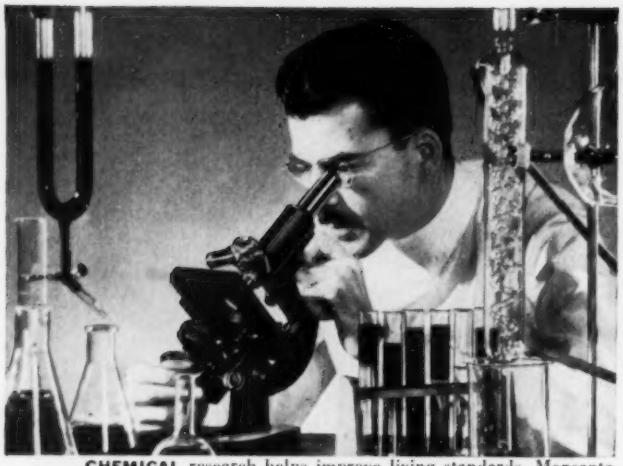
Irregularly shaped objects are easily inspected by submerging them in a tank of water. When they are thus immersed, the probe need not be in physical contact with the surface. Flaws close to the surface (about 0.10 in.) are easily detected by this method.

Physical Work—Delicate parts that must be critically clean—such as surgical instruments, ball bearings, fine screens and grids for vacuum tubes—can be made cleaner than ever before. Cost is fairly high, but the result cannot be duplicated by any other means.

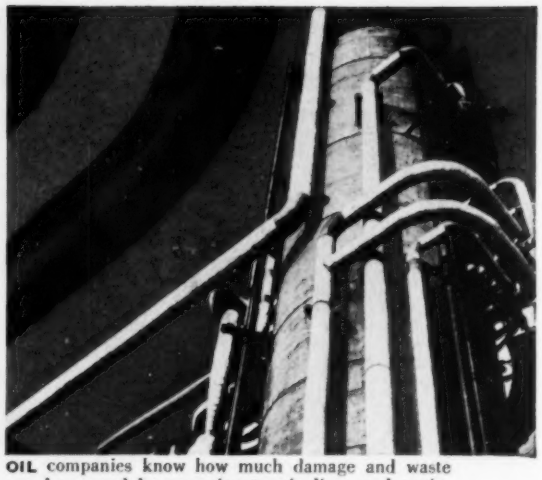
Degreasing metal parts and removing oxide scale or coatings can be facilitated with sonic energy. Degreasing would be costly on a large scale, but immersion time is cut to perhaps 1% or less. Oxide on metals, particularly aluminum, presents removal problems. Sonic energy easily solves the problem. Solder joints can be made with aluminum that are as good as joints in most other metals.

Abrasive Cutting—Metals, including tungsten carbide, are being cut with sonic energy in more and more shops. Cutting square holes and other unusual shapes in carbide extrusion dies to close tolerances gives promise of expanding the horizons for extruded metals.

Mixing—Water and oil, mercury, and many other normally immiscible liquids can be mixed by violent agitation of the molecules of both liquids at the same time and place. But placing a container filled with the liquids on top of transducer will not do the job efficiently. So the laboratories have come up with methods for focusing sonic energy. A separate pipe delivers each liquid. Sonic energy is focused at the point where the liquids meet. A third pipe removes the mixture.—Factory, Mar, p84



CHEMICAL research helps improve living standards. Monsanto Chemical is one of the prominent companies with a continuing research program. Monsanto is also one of the companies EBASCO has been privileged to serve with engineering and market study services.



OIL companies know how much damage and waste can be caused by corrosion to pipelines and equipment. EBASCO has served Trans-Northern Pipe Line Company of Canada through corrosion surveys and application of various methods of corrosion control.

MANY DIFFERENT INDUSTRIES SOLVE INSIDE PROBLEMS WITH OUTSIDE HELP

Modern industrial expansion often creates special situations that demand special services. That's where EBASCO is able to assist many kinds of businesses and industries across the nation and around the world.

EBASCO keeps its services in step with the times. They are geared to meet the exacting requirements of today's new processes, new technologies, new horizons. Such knowledge is a must in serving industries like those shown on this page.

If your business faces a special problem, the services EBASCO offers may well be your answer. Our booklet, "The Inside Story of Outside Help," describes these services. May we send you a copy? Just write or phone Ebasco Services Incorporated, Dept. D, Two Rector Street, New York 6, N. Y.

PULP & PAPER industry growth has resulted in wide expansion of production facilities. Rayonier Incorporated, a leader in the industry, engaged EBASCO to design and construct its $25,000,000 chemical cellulose mill in Jesup, Georgia.

STEEL plant under construction at Owensboro, Kentucky. The design and construction is being handled by EBASCO for the Green River Steel Corporation. This plant is scheduled for completion this year.

GAS pipeline of the East Tennessee Natural Gas Co. under construction. This pipeline, now in operation, carries natural gas from Greenbrier, Tenn., to the Atomic Energy Plant at Oak Ridge. EBASCO was engaged to handle the entire project from preliminary planning to "in service" operation.

EBASCO — ENGINEERS · CONSTRUCTORS · BUSINESS CONSULTANTS

NEW YORK • CHICAGO • WASHINGTON, D. C.

Appraisal • Budget • Business Studies • Consulting Engineering • Design & Construction • Financial • Industrial Relations • Inspection & Expediting Insurance, Pensions and Safety • Purchasing • Rates & Pricing • Research Sales & Public Relations • Space Planning • Systems & Methods • Taxes Traffic • Washington Office

MANAGEMENT REPORT

Foreign inventors and companies are affected by the new U. S. patent law that went into effect on Jan. 1, 1953. If you file an application for a patent in your country and also want a U. S. patent, you must file in the U. S. within 1 yr. from the date on the application in your own country. You must make a claim for priority and file a certified copy of the original foreign application in the U. S. Patent Office to prove your priority as a foreign inventor.

Another point of the new law that can affect you is that a new use of a known process, machine, manufacture, composition of matter, or material can be patented for the new use even though the subject is already patented for other uses. This provision opens up an enormous area of invention.—Prod Eng, Apr, p186

Americans don't have to go to Europe to buy top-quality British goods. Joyce Wells Ltd. operates an England-to-America mail-order catalog service from England. The firm's catalog offers British boots, shoes, candies, rugs, leather goods, silver, dresses, overcoats, men's jackets, children's wear, and antiques. All articles are specially chosen for their appeal to the American taste. According to Joyce Wells, it's a booming business. And the idea could mean booming business for other companies eager to sell to the U. S.

It's time for management to think, and maybe do some preliminary planning, about the automatic plant. At an American Management Association meeting in December, industry experts agreed that rising labor costs, the need for more uniform product quality, and technical necessities are bringing the automatic factory closer every day.

Automation will bring many changes in industrial methods and personnel. More creative product design will be needed as designers will have to fit new products to the new production processes. Personnel requirements will change too. Supervisors will need more technical knowledge and more skill in dealing with employees. Demand for engineers will increase. Biggest production problems will be in materials handling, assembly, finishing, and inspection.—Chem Eng, Mar, p286

The "trade, not aid" policy got a setback when an equipment bid submitted by Britain's English Electric Co. Ltd. for a U. S. dam was kicked around Washington offices. Even though the bid was 13% under the nearest U. S. company's bid, the 1933 "Buy American" act stopped its acceptance. One interpretation of the act says that federal purchases can be made only if the import price is 25% under the U. S. price.

An embarrassed U. S. government rejected all bids. No one is sure when new bids will be called for. But the British feel that the cancellation is a reversal of the U. S. administration's policy. So "trade, not aid" won't be really effective until Congress repeals the Buy American act.

Prospects of raising exports of British cotton to nearly three times last year's volume are still hazy, according to the British *Financial Times*. The estimate was set last September at the Buxton conference.

On the surface, little appears to have been done to stimulate the imagination of British exporters, and a dearth of workable offers from overseas is reported.

The Cotton Board and others are trying to spur manufacturers' efforts, but individual firms know nothing about how the actual business is to be arranged. An "inner council" of spinners, weavers, finishers, and traders has tried to agree on a plan to sell bulk cotton goods to suitable markets. —Textile World, Apr, p308

Take a tip on fuel savings from Monsanto Chemicals, Ltd., Newport, England. Its fuel-savings committee appoints fuel watchers for each shift. Watchers, who report steam leakages and other faults, in addition to carrying on normal duties, get rewards for fuel-saving ideas. Committee also issues posters, displays fuel efficiency exhibits, checks on repairs of leakages.—Mach, Feb 14, p249

The Japanese optical industry is aiming to win the quality position previously held by Germany. Better design and lower prices have gone a long way toward boosting reception by the U. S. public of Japanese cameras.

U. S. Customs Bureau's recent decision to require all dutiable goods from East Germany to be labeled "Made In Soviet-Occupied Germany" will also help boost Japanese sales. U. S. buyers are not likely to take anything with that label.

Diamond merchants and dealers feel that the threat of world-wide inflation is disappearing. They base their conclusion on the fact that diamond prices are trending downward. Currencies are being stabilized, and there is little need for hoarding.

Pick's World Currency Report says that Brazil has about the only healthy diamond market in the world. The drop in the cruzeiro takes credit for the Brazilian market situation.

PRODUCTION IDEAS

from Manufacturers' Catalogs

Trucks—Bulletin gives specifications and engineering data on heavy-duty, all-wheel drive trucks for on- and off-highway jobs.—Oshkosh Motor Truck Inc., Oshkosh, Wisc.

Land Clearing—Brochure E-74-B tells how crawler tractors were used to clear bush and jungle in land reclamation programs in Brazil and Chile.—International Harvester Co., Harvester Bldg., Chicago, Ill.

Four-cycle Engines—Four-cycle diesel, Duafuel and spark-fired gas engines with 9-in. and 13-in. bores are illustrated and described in bulletin 205.—Nordberg Mfg. Co., Milwaukee, Wisc.

Steel Shelving—Bulletin 859-E-7½M-11-52 pictures Berger steel shelving and bins in both Wedge-Lock and convertible models.—Republic Steel Corp., Export Dept., Chrysler Bldg., New York 17, N. Y.

Fluorescent Starters—Technical data on automatic reset starters and manual reset starters for fluorescent lamps are available.—Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N. Y.

Substituted Phenols—Literature is available on the characteristics and many industrial uses of substituted phenols.—Dow Chemical International Ltd., Dept. EX 3-70, Midland, Mich.

Polishing Belts—"How Polisher Pete Put Economy in Polishing" describes Metalite cloth belts for finishing products with a minimum of polishing.—Norton Behr-Manning Overseas, Inc., New Rochelle, N. Y.

Materials Handling—Condensed Catalog gives data on electric and gasoline-powered fork trucks and industrial towing tractors and their value in industry.—Clark Equipment Co., Export Div., Battle Creek 73, Mich.

Copying Machine—Bulletins cover Antara O-M machine that can be used to copy accounting reports, invoices, purchase orders, and other business forms.—General Aniline & Film Corp., Johnson City, N. Y.

Slitting Machine—The economics and mechanics of the slitter operation are analyzed and discussed in the Slitter Book.—The Yoder Co., 5517 Walworth Ave., Cleveland 2, Ohio.

Conveyor—Complete catalog of materials-handling equipment features actual installations of conveyor units, lines, and systems.—Rapids-Standard Co., Inc., 98 Rapistan Bldg., Grand Rapids 2, Mich.

Stenographic Department—"Increase Office Productivity through a Centralized Stenographic Department" tells how to set up such a department and make it operate successfully.—Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y.

Insulating Wool—Bulletin WB-1 describes and gives properties of Microlite glass-fiber insulating wool and its use in many industries.—Glass Fibers Inc., 1810 Madison Ave., Toledo 2, Ohio.

Plastics—"Facts About Plastics" gives the layman an introduction to plastics, production methods, and their many uses in many industries.—The Richardson Co., 250 West 57th St., New York 19, N. Y.

Brush Killers—Manual on the use of Weedone brush killers gives application techniques, information on spraying equipment, and classification of woody plants.—American Chemical Paint Co., Ambler, Pa.

Plumbing Supplies—Flexible plumbing supplies of chromium-plated copper tubing and flare fittings in all types and sizes are described in catalog 13052.—Brass Craft Mfg. Co., 2821 Brooklyn Ave., Detroit 1, Mich.

Earthmoving Equipment — Catalog MS-449-5211 gives capacity, horsepower, speeds, and weights of rubber-tired motor scraper and motor wagon earth-moving machines. — Allis-Chalmers Mfg. Co., Tractor Div., Milwaukee 1, Wisc.

Cash Registering Machines—Bulletin illustrates cash registering machines that also print records of amounts registered.—Burroughs Adding Machine Co., 6071 Second St., Detroit 2, Mich.

Chemicals — Catalog describes and gives applications of alkalies and related chemicals.—Columbia-Southern Chemical Corp., 632 Duquesne Way, Pittsburgh 22, Penna.

Packaging Machines—Literature describes bag-making and packaging equipment that automatically forms, fills, and seals transparent packages.—Simplex Packaging Machinery, Inc., 534 23rd Ave., Oakland 6, Calif.

Diesel Engines—Bulletin 5336 illustrates the many uses of diesels in scraper and 'dozer, truck haulage, shovel and crane, and other heavy construction and mining equipment.—Cummins Engine Co., Inc., Columbus, Indiana

Oscillating Conveyors—A guide to correct selection and application of flexmount positive-action oscillating conveyors is given in bulletin 2478.—Link-Belt Co., 233 Broadway, New York 7, N. Y.

Materials-handling Trucks—Catalog 34 describes engineering, operating and maintenance features of the Jacklift Electric and the Master Jackstacker Truck. It also mentions gas-electric units.—Lewis-Shepard, Watertown, Mass.

Industrial Pumps—Bulletins on pumps for following fields: contracting, petroleum, irrigation, industrial, utility, sewage, railroads, fire fighting, and marine. Please specify which bulletin you want.—Marlow Pumps, Ridgewood, N. J.

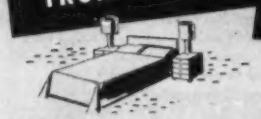
Air Conditioning—"Planning Guide For Industrial Air Conditioning" tells how to improve morale and production in plant and office.—Westinghouse Electric International Co., Dept. W, 40 Wall St., New York 5, N. Y.

Terminals—A-MP technical data catalog "The Story Behind the A-MP Terminal You Buy" has three sections: engineering and research facilities, technical data, and cost and time studies.—Aircraft-Marine Products Inc., 2100 Paxton St., Harrisburg, Pa.

Steam Boilers—Form SG 128–749–10–20M describes self-contained steam boilers for processing and heating.—Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wisc.

Please Write Directly . . .

. . . to the manufacturers for the free literature announced on this page. Tell them definitely which catalog you want—specify the catalog number or its name when either one is given. And mention that you saw the offer in the McGraw-Hill Digest.



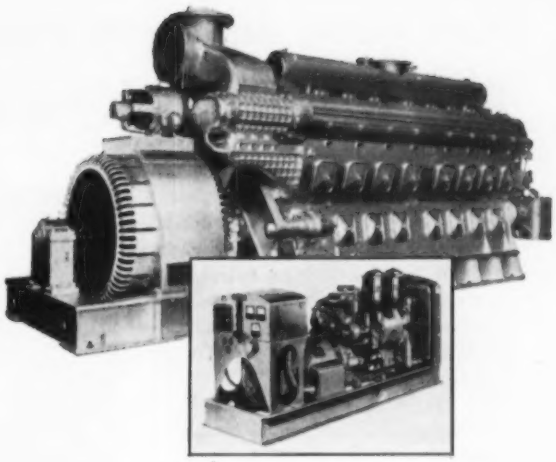
You can test practically *anything* with a

RIEHLE

Universal Testing Machine. Every Riehle Pendomatic has 5 scale ranges. On the same machine, you can test specimens with relatively low rupture points and also high yield point specimens. Just turn selector knob to logical range, conduct test. Guaranteed accuracy within ½ of 1%. Ask your Riehle representative or write our factory for illustrated catalogs on Riehle Universal Testing Machines with hydraulic loading unit or screw power loading unit.

Photo courtesy of Cleveland Tank Plant, Cadillac Motor Car Division, General Motors Corporation.

RIEHLE TESTING MACHINES
Division of American Machine and Metals, Inc.
233 Broadway, Foreign Sales Dept., New York, U.S.A.



More efficient electric power ..... production

GM DIESEL POWERED GENERATOR SETS DELIVER MORE ELECTRIC POWER PER UNIT WEIGHT

Capacities range from 20 to 1000 Kilowatts, and are designed to permit paralleling in varying combinations thus meeting a wide variety of requirements.

Full rated capacity is immediately available on starting – no warm up period required.

GM 2 Cycle Diesel Powered Generator Sets are shipped fully assembled.

Compactness and lightness of weight minimizes installation costs.

GM factory trained service personnel are available for installation and start-up inspections anywhere in the world, thus assuring an effective, dependable source of electric power.

The World's Greatest Producers of Diesel Power

GM GENERAL MOTORS DIESEL POWER

For Information Address GENERAL MOTORS at . . .

ARGENTINA	Buenos Aires	MEXICO	Mexico, D. F.
AUSTRALIA	Melbourne	NEW ZEALAND	Wellington
BELGIUM	Antwerp	PAKISTAN	Karachi
BRAZIL	Sao Paulo	PERU	Lima
DENMARK	Copenhagen N.	PORTUGAL	Lisbon
EGYPT	Alexandria	SOUTH AFRICA	Port Elizabeth
ENGLAND	London, S.W. 1	SPAIN	Barcelona
FRANCE	Paris	SWEDEN	Stockholm 20
GERMANY	Russelsheim/Main	SWITZERLAND	Bienne
INDIA	Bombay, No. 1	URUGUAY	Montevideo
INDONESIA	Djakarta	VENEZUELA	Caracas

GENERAL MOTORS OVERSEAS OPERATIONS
NEW YORK 19, NEW YORK, U.S.A.

If you are

Please notify us of your new address in advance to insure uninterrupted service on your subscription to the McGRAW-HILL DIGEST. Use the convenient change of address form below and mail to:

MANAGER OF CIRCULATION
McGRAW-HILL DIGEST
330 West 42nd Street,
New York 36, N. Y., U. S. A.

Name.....
New Address.....
.....
My Old Address.....
.....
My New Position.....
New Company Name.....
Our Main Business is.....

DON'T FORGET TO NOTIFY YOUR POSTMASTER, TOO!

Here's Another Magazine We Digest

For Builders Know-How

American Builder is the horizontal magazine of the light-construction industry. It is read monthly by 102,000 home builders, retail-lumber and building-material dealers, wholesalers, jobbers, architects, engineers, subcontractors, and other building professionals. It is in its 75th year and is published by the Simmons-Boardman Publishing Corp.

Editorially, American Builder performs the dual function of reporting important news and developments, and creating staff-written research articles to lead industry thinking or to aid in solving industry problems. It is the proud possessor of numerous citations and awards in recognition of editorial leadership over many years.

Among the more important of these is an illuminated plaque awarded to the editor by the National Association of Home Builders for conceiving the idea for National Home Week in 1948. This has become the industry's greatest merchandising and promotion program.

The magazine's editors are a trained group of journalists, architects, engineers, and building professionals, supplemented by a full-time corps of artists and draftsmen. They travel extensively, attend several hundred industry meetings each year, are known personally to thousands of their readers, annually address more than 100 meetings of builders, dealers, and manufacturers, keep closely attuned to the thinking and problems of the industry.

Edward G. Gavin
Editor, American Builder

Headquarters are in Chicago, Ill., but a full-time eastern editor is based in New York, N. Y., and a full-time western editor in Los Angeles, Calif. With this personnel and disposition of forces, American Builder maintains its enviable position in an industry undergoing unprecedented expansion.

ADVERTISERS IN THIS ISSUE

ALLIS-CHALMERS MANUFACTURING CO., General Machinery Div.	40	HEIL CO.	30
ALLIS-CHALMERS MANUFACTURING CO., Tractor Div.	1	HYDRAULIC PRESS MFG. CO.	51
AMERICAN CYANAMID CO.	2	INTERNATIONAL GENERAL ELECTRIC CO.	2nd Cover
AMERICAN MACHINE & FOUNDRY CO.	48	INTERNATIONAL HARVESTER EXPORT CO.	20
BETHLEHEM STEEL EXPORT CORP.	4	INTERNATIONAL STANDARD ELECTRIC CORP	35
BLAW-KNOX CO.	36	KLOCKNER-HUMBOLDT-DEUTZ AG, KOLN.	6
BUNDY TUBING CO.	5	NATIONAL BROACH & MACHINE CO.	3rd Cover
BURROUGHS ADDING MACHINE CO.	10	NORDBERG MFG. CO.	43
CHASE NATIONAL BANK OF THE CITY OF NEW YORK	32	PRESSED STEEL CAR CO., INC.	23
CLARK EQUIPMENT CO.	37	REMINGTON RAND, INC.	38
CORNING GLASS WORKS	27	REYNOLDS METALS CO.	8
CUMMINS DIESEL EXPORT CORP.	49	RIEHLE TESTING MACHINES, DIV. AMERICAN MACHINE & METALS, INC.	59
DORR CO.	26	RUSSELL, BURDSALL & WARD BOLT & NUT CO.	24
DOW CHEMICAL INT'L. LTD.	52	SERVEL INC., INTERNATIONAL DIV.	9
EBASCO SERVICES, INC.	56	TOLEDO SCALE CO.	46
ENTERPRISE ENGINE & MACHINERY CO.	4th Cover	UNDERWOOD CORP.	50
ERIEZ INTERNATIONAL CORP.	17	VICTOR SAW WORKS, INC.	50
EX-CELL-O CORPORATION	47	WATSON-STILLMAN CO.	31
GENERAL MOTORS OVERSEAS OPERATIONS	59	WESTINGHOUSE ELECTRIC INT'L. CO.	12

Publications Digested:

McGraw-Hill Publishing Co., Inc.,
330 W. 42nd St., New York 36, N. Y.
American Machinist
Aviation Week
Bus Transportation
Business Week
Chemical Engineering
Chemical Week
Coal Age
Construction Methods & Equipment
Electrical Construction & Maintenance
Electrical Merchandising
Electrical West
Electrical Wholesaling
Electrical World
Electronics
Engineering & Mining Journal
E&MJ Metal & Mineral Markets
Engineering News-Record
Factory Management & Maintenance
Fleet Owner
Food Engineering
Industrial Distribution
Machinist (London Office)
National Petroleum News
Nucleonics
Petroleum Processing
Pharmacy International
Power
Product Engineering
Textile World
The American Automobile (Overseas Edition)
The Welding Engineer

Chilton Company,
Chestnut and 56th St., Philadelphia 39, Pa.
Automotive Industries
Boot & Shoe Recorder
Hardware Age
The Iron Age
The Optical Journal & Review of Optometry

Dartnell Publications, Inc.,
4660 Ravenswood Ave., Chicago 40, Ill.
American Business

Fritz Publications, Inc.,
431 S. Dearborn St., Chicago 5, Ill.
The Paper Industry

Industrial Publications, Inc.,
5 South Wabash Ave., Chicago 3, Ill.
Ceramic Industry

Modern Packaging Corp.,
575 Madison Ave., New York 22, N. Y.
Modern Packaging

Modern Plastics, Inc.,
575 Madison Ave., New York 22, N. Y.
Modern Plastics

Petroleum Publishing Co.,
211 S. Cheyenne Ave., Tulsa 1, Okla.
The Oil and Gas Journal

Simmons-Boardman Publishing Corp.,
30 Church St., New York 17, N. Y.
American Builder
Marine Engineering
Railway Age
Track and Structures
Locomotive and Cars
Railway Signaling & Communications

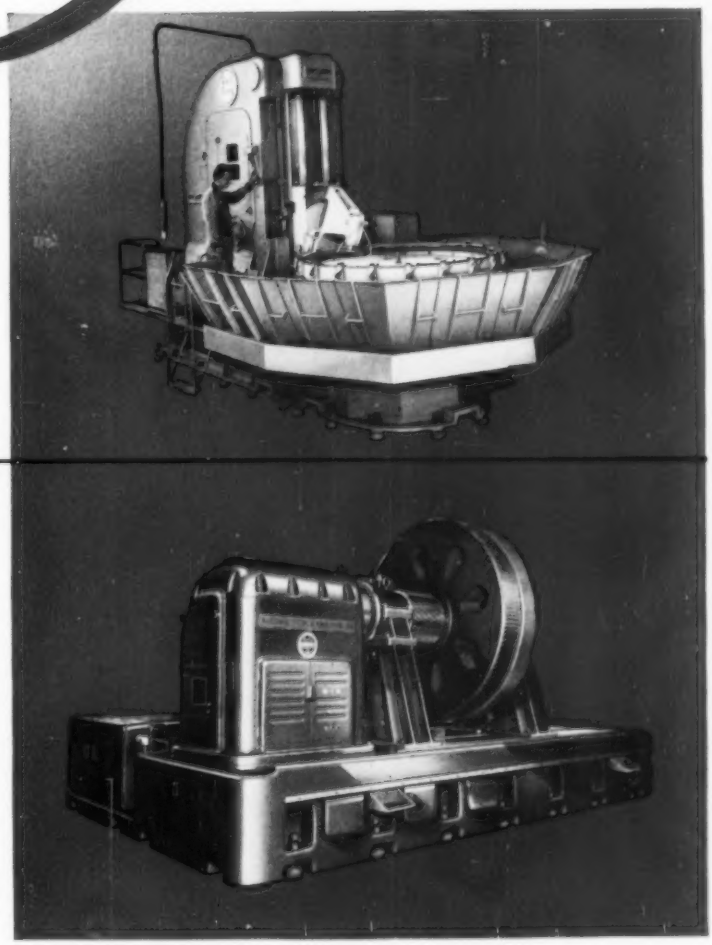
McGraw-Hill World News Bureaus: *London, Paris, Frankfurt, Tokyo, Bombay, Melbourne, Mexico City, Rio de Janeiro, Stockholm, Manila, Madrid, Tel Aviv, Rome, Ottawa, Belgrade, Tehran, Helsinki, Athens, Brussels, Copenhagen, Wellington, and 30 other industrial cities.*

Large marine gear finishing practice moves ahead

ABOUT 11 years ago the first Red Ring machine for shaving large marine propulsion gears (up to 96" PD) was completed and put into commission. Its high precision and spectacular economy promptly initiated the now accepted practice of shaving for such gears.

Since then Red Ring machines have been built to shave larger marine gears. The United States, our fastest and largest ocean liner, launched last year, is driven by reduction gears shaved on Red Ring machines.

And now, nearing completion is a giant shaving machine to finish marine gears 15 feet in diameter to almost incredible tolerances on tooth form, pitch, lead and surface finish. With slight modifications, this unit will handle gears up to 200" PD.



SPUR AND HELICAL GEAR SPECIALISTS

ORIGINATORS OF ROTARY SHAVING AND ELLIPTOID TOOTH FORM

NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN . . . . . DETROIT 13, MICHIGAN

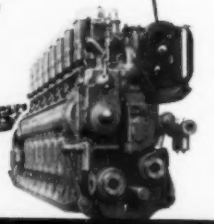
WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

6282

Parts within Hours
—from Factory to You

Check these points on Enterprise Diesel Service

- 12 service offices, strategically located parts warehouses — for fast round-the-world service.
- Prompt processing and factory delivery on parts not normally stocked in local warehouses.
- Quick handling of all routine or emergency overhaul work.
- Expert supervision of any engine service constantly available by experienced ENTERPRISE Service Engineers.
- **ADD IT ALL UP and it pays to buy ENTERPRISE—backed by ENTERPRISE *Specialized Service.***



Take the case of this "hurry-up" call from Venezuela, for example—

On January 9th at 10:30 A. M. this cable was handed to M. T. Prendergast, ENTERPRISE Manager of Service Parts in San Francisco:

"URGENT AIR EXPRESS TWO FUEL TAPPET AND GUIDE ASSEMBLIES NO. 78153"

It came from T. P. Jiminez, Manager, Fuerza Luz Tuy—power company in Ocumare Del Tuy, Venezuela. Prompt handling saw this rush order airborne by early afternoon, and *delivered to the customer 44 hours and 15 minutes later!*

This is typical of the service you can expect from ENTERPRISE. We know what delivery delays can mean—how costly it can be when engines are idle for need of a part. That's why ENTERPRISE Parts Service is geared to the *customer's* requirements, and why we insist that furnishing prompt and efficient service is every bit as important as building the very finest Diesel engine.

Write for new descriptive bulletins, or call your nearest Enterprise Diesel Sales Office.

Enterprise
DEPENDABLE
Diesels

ENTERPRISE ENGINE & MACHINERY CO.
Export Dept.: 18th & Florida Streets, San Francisco 10, California
A SUBSIDIARY OF GENERAL METALS CORPORATION

Cable Address: ENTERFOUND